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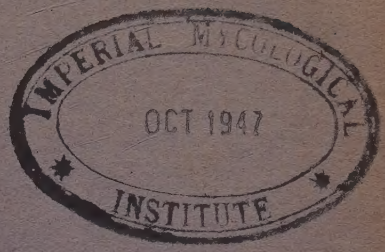

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Errata

V.B. **17.** 214, abst. 911, for "*Pfeifferella pestifer*" read "*Pfeifferella anatipestifer*".

V.B. **17.** 253, abst. 1091, 2nd column. For "SHEEP POX was said to cause 100% mortality", read "SHEEP POX was said to cause 10% mortality and 100% abortions".

REVIEW ARTICLES

(1) "The Present Position of Phenothiazine as an Anthelmintic".

(2) "Trichomoniasis—A Review of Recent Literature".

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DISEASES CAUSED BY BACTERIA AND FUNGI

RAMON, G., & RICHOU, R. (1945.) Des propriétés antagonistes des filtrats de culture du *Bacillus subtilis* à l'égard de certaines bactéries et des toxines microbiennes. [**The antagonism of filtrates of *B. subtilis* to the toxins of certain bacteria.**]—*Bull. Acad. vét. Fr.* **18.** 164–171. **1480**

A filtrate of *B. subtilis* culture produces bacteriostatic, bacterial and bacteriolytic actions against a number of organisms, especially *Corynebact. diphtheriae.* If the filtrate is mixed with diphtheria toxin and incubated for 24-48 hours, the mixture is no longer toxic to g. pigs. A similar effect is produced on tetanus toxin, but the action is slower, and effects have also been demonstrated against the toxins of gas gangrene organisms (*e.g., Cl. welchii*). The theoretical and practical significance of these results is discussed. —J. M. ROBSON.

CHRISTIE, R., & NORTH, E. A. (1941). **Observations on staphylococcal beta toxin and its production by strains isolated from staphylococcal lesions in man.**—*Aust. J. exp. Biol. med. Sci.* **19.** 323–327. **1481**

Although staphylococci from human disease rarely produce β-toxin, it was demonstrated in masked form in 39 of 43 strains freshly isolated from boils and in 58 of 72 old strains. β-toxin specifically denatures globulin to an even greater extent and albumen of human serum, and this is suggested as the basis of a test for $\alpha\beta$ strains which produce insufficient β-toxin to give the typical appearance on sheep blood agar plates.

It is suggested that β-toxin may limit the spread of a staphylococcal lesion by denaturing tissue and serum proteins, coagulase also assisting by its primary action (coagulation of fibrinogen), but that when β-toxin has lowered the concentration of albumen and globulin in the surrounding fluids, the second action of coagulase (fibrinolysis) predominates and leads to liquefaction.—A. W. B.

SPENCER, G. R., MCCARTER, J., & BEACH, B. A. (1946.) **Reservoirs of infection on Streptococcus Agalactiae.**—*Amer. J. vet. Res.* **7.** 32–36. **1482**

The probability that *Str. agalactiae* is an obligate parasite is discussed and the importance of determining the rate of death of the organism outside the udder is emphasized.

The authors used a triple dye medium to inhibit contaminants in their attempts to recover *Str. agalactiae* from the floor and bedding under infected cows and from milkers' hands. No Group B organisms could be isolated from the bedding but they were present on the hands of two out of ten milkers.

To test the rate of death of the organism in bedding, a calculated number were added to weighed quantities of bedding and kept at room temperature (at 7°C. in one case). Death was very rapid but refrigeration delayed death for some days.—C. D. WILSON.

LÖFSTRÖM, G. (1946.) **Serologic relationship between a γ-streptococcus strain and a number of pneumococcus types.**—*Acta path. microbiol. scand.* **23.** 80–83. [In English.] [Author's summary copied *verbatim.*] **1483**

The existence of a γ-streptococcus showing a close antigenic relationship to Pneumococcus type 19 B is demonstrated.

JASPER, D. E., KANEGIS, L. A., & WEIRETHER, F. J. (1946.) **An unusual structure associated with bovine necrotic mastitis.**—*Cornell Vet.* **36.** 268–276. **1484**

A Guernsey cow experimentally infected in the left rear quarter of the udder with *Bact. aerogenes* failed to recover, despite intensive chemotherapy, and was killed on the 42nd day. P.M. findings included severe necrotic mastitis of the infected quarter and, embedded in the necrosed mass, a firm, branching structure with branches up to 2·5 cms in diameter. Histologically these branches consisted essentially of a connective tissue core surrounded by stratified squamous epithelium. The connective tissue varied, sometimes containing glandular tissue,

or a capillary network or a core of greatly thickened blood vessels; the epithelium was well differentiated with its outer layers keratinized and, in some sections, well marked pegs of epithelial cells invading the connective tissue and sometimes cut off to appear in transverse section concentrically arranged round central necrotic debris or keratinized cells.—L. M. M.

URBAIN, A. L'infection tuberculeuse en 1942 et 1943 chez les mammifères et les oiseaux exotiques du museum. **[TB. in exotic birds and mammals in zoological gardens in 1942 and 1943.]**—*Bull. Acad. Méd. Paris.* **127.** 499–504. **1485**

TB. is one of the most common diseases of wild animals in captivity. From January, 1942, until September, 1943, U. observed at zoological gardens 22 new cases among mammals and 39 among birds.

The disease is common in monkeys, which are in close contact with human beings, and infection is usually serious. In three cases, death followed in 5–6 weeks from the onset of symptoms (diarrhoea, loss of weight, breathlessness and coughing). TB. was also diagnosed P.M. in a Hamadryad baboon which died suddenly. Human type tubercle bacilli were isolated from all four animals.

One case is recorded of TB. in a seal, which went off its food and lost condition for about three weeks and then recovered its appetite and appeared normal until it was suddenly found dead. Human type bacilli were recovered P.M.

In another case an American tapir, which had been born in a zoo, was suckled by its dam, which died of TB. a year later. The young tapir reacted strongly to tuberculin tests, at different times, intradermally, intra-ocularly and hypodermally. It was isolated and appeared normal until six and a half years old, when it grew thin and lost appetite. A month later a submaxillary swelling developed, making mastication impossible. Four months later the animal died. Bovine type bacilli were isolated.

Other cases described include two lions, two panthers and a cheetah (all bovine type TB.), three wild boar (all human type), an American bison, a gaur (*Bos gaurus*) a buffalo, a gayal (*Bos frontalis*), a waterbuck (*Cobus defessa unctuosus*), a moose, a stag and a muntjac (*Muntiacus muntjac*).

Among birds TB. was generally diagnosed only P.M. In a few cases, birds had been isolated as a result of symptoms such as dull plumage, somnolence and lameness.—S. M. G.

HOUTHUIS, M. J. J. (1941.) Kort, voorloopig verslag van het paratuberculose-onderzoek over 1200 gevallen van chronische enteritis bij runderen gedurende de jaren 1936 tot en met 1939. **[Report of the examination for Johne's disease of 1,200 bovines with chronic enteritis, 1936–39.]**—*Tijdschr. Diergeneesk.* **68.** 853–866. [English, French and German summaries: abst. from English summary.] **1486**

An investigation was carried out at the public abattoir, Rotterdam, to determine to what extent Johne's disease was instrumental in producing the chronic enteritis diagnosed in 1,200 bovines; 1,015 cases of Johne's disease were found.

Microscopic examination of scrapings of the mucosa in the neighbourhood of the ilio-caecal valve was of greater value in diagnosing Johne's disease than scrapings from the mesenteric lymph nodes or rectal mucus membrane. During 1938–39, of 474 animals with Johne's disease, 110 had liver degeneration.

MEYN, A., & WEISKE, G. (1943.) Das Huhn als Versuchstier für Paratuberkulose. **[Susceptibility of fowls to Johne's disease.]**—*Dtsch. tierärztl. Wschr.* **51.** 62–63. **1487**

Fowls had been used as test animals for leprosy in Japan, an irritant substance which furthered the growth of histiocytes being injected along with the leprous material. The authors used a similar method for Johne's disease.

In the first experiment, 0·5 g. of pure culture in 10 ml. of physiological saline were mixed with 0·1 g. silicious earth, 0·1 g. trypanblue and 0·1 g. potassium iodide and the whole was filtered through gauze. 5 ml. of this mixture were injected into the right breast muscle of two hens and the irritant solution alone was injected into the left. The general state of health of the hens appeared to remain normal and after four months the first hen was killed. In the right breast muscle was found an irregularly shaped, blue and orange coloured capsulated focus about the size of a plum, in which acid-fast bacilli in clumps could be seen. The left muscle had only a slight blue colouration. Other organs and tissues remained unaffected. The second hen was killed 13 months after injection. The right breast muscle was bluish and contained a hard, greenish-blue, fibrous swelling, 4 cm. by 2 cm., like that in the first hen. The left breast muscle was also similar to that in the first hen.

In a second experiment, 0·5 g. of the breast muscle from the second hen were finely ground and injected as before into two hens, both of which were killed after four months. P.M. and microscopical findings were as before. Another bird was inoculated into the right breast with infected tissue from these two hens and into the left breast with culture without the irritant. Five months later the hen was killed: the right muscle was similar to that in the other hens and the left

had several small nodules about the size of millet seed, a few acid-fast bacilli were found. All micro-organisms isolated were identified by cultural and animal tests as *M. johnei.*

No clinical symptoms were noted in any of the hens infected intramuscularly with the irritant and infected tissue. P.M. findings were always the same. The reaction of the tissue to the irritant in growth of histiocytes is thus an important factor in the propagation of the bacilli.—G. H.

LINHARES, H. (1944.) Estudo sôbre a célula leprosa do rato. **[The lepra cell in rats infected with** *Mycobact. leprae muris.***]**—*Mem. Inst. Osw. Cruz.* **40.** 183–189. [English summary.] **1488**

The so-called "lepra" cells in rats infected with murine leprosy (large phagocytic cells filled with leprosy bacilli and found in the reticulo-endothelial system in the spleen, bone marrow, lymph nodes, liver and lungs) were found to take up pyrrhol blue and lithiocarmine injected into the rats. In skin sections it was possible to observe connective tissue histiocytes developing into lepra cells.—I. W. JENNINGS.

SAXER, E. (1946.) Ein Fall von chronischen Rotz bei einem Maultier. **[A case of chronic glanders in a mule.]**—*Schweiz. Arch. Tierheilk.* **88.** 345–359. **1489**

Altogether, eight cases of glanders were diagnosed in Switzerland during the last 30 years. A detailed review of the pathology, incidence, diagnosis, and course of the disease in horses, mules and donkeys is given. Details are given of an infected mule.—C. AHARONI.

I. ROEMMELE. (1943.) Das Rotlaufproblem im Ostland. **[The swine erysipelas problem in the Baltic States.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* August 20th. 273–279. **1490**

II. WIEMANN. (1943.) Schutzimpfungen mit Rotlauf-Vakzinen. **[Immunization with swine erysipelas vaccines.]**—*Ibid.* Oct. 1st. 341–342. **1491**

I. This is a detailed account of S.E. and its control in 1941 and 1942 in the Baltic countries and parts of White Russia. Numerical records for these two years are given for Latvia, Lithuania and Estonia as follows:—

	Infected holdings	Affected pigs	Pigs dying from S.E.
1941			
Latvia	14,676	20,690	2,065
Lithuania	16,589	20,887	3,865
Estonia	6,088	7,957	738
1942			
Latvia	23,413	30,999	4,560
Lithuania	26,505	34,637	8,588
Estonia	13,123	15,971	1,702

The records show a strong seasonal incidence peak in the late summer and autumn months, especially from July to October inclusive. This is ascribed to the influence of the weather, to the sudden changes from cyclonic to anticyclonic type and to cold spells.

Other factors which may influence the incidence of S.E., such as breed, management, soil type and feeding are referred to, but no original evidence is given. Reference is made to recent observations of KOBE [*V. B.* **14.** 201] that attacks of "infectious gastro-enteritis" may precipitate acute S.E. and it is related that the S.E. was, contrary to expectations, set up in healthy young pigs of 100 kg. weight by subcutaneous injection of *E. rhusiopathiae*, the contributory stimulus being the fact that the animals had just arrived after a long journey; appeared to be healthy when inoculated.

With regard to immunization, records not previously published and here given show the poor results of antisera alone and the better results from the use with both culture and antisera by the Lorenz method. For instance, in Estonia the percentage losses in the four years 1936–39 were, in pigs treated with antisera, 0·26–0·31, and in unimmunized pigs, 4·6–14·5. In Latvia, losses after treatment with antisera alone varied between 0·34 and 1·41% over six years. In 1941, under Russian dominion, 5,774 pigs in Latvia were inoculated with Russian formol vaccine. The results obtained were not available owing to disturbance by military operations.

In 1942, tests of formol vaccine were carried out. After 100 test pigs had been vaccinated and resisted artificial infection, 16,130 pigs in Latvia were vaccinated. Within 20 days, 369 (2·3%) had sickened of S.E. and 151 died or were killed. Investigation proved (1) that these cases were really S.E. and not any other disease and (2) that the vaccine was certainly non-viable and so could not have set up infection. A noteworthy point was that five outbreaks of S.E. after vaccination were all associated with a single veterinary practitioner working on one evening and the following morning. Vaccination

with the same batch by another man was not followed by any trouble.

Turning to the culture and antiserum method, R. first makes the point that the culture strain used should be the same as that used for the immunization of the horses for antiserum production and that it should be tested on pigs before issue. Secondly, the dose of antiserum should be limited and the dose of culture should not be too small.

In 1942, 50,961 pigs in Estonia were immunized by culture and antiserum and 275 (0·54%) sickened and 25 of them died later, presumably from S.E. In Lithuania, 159,672 pigs were immunized: 492 (0·3%) sickened and 46 (0·03%) died of S.E. In Latvia, 9,007 pigs were immunized and given a second injection of culture 12–21 days later. 131 (1·5%) pigs sickened of S.E. and 44 (0·5%) died.

In discussing future policy, the culture and antiserum method is advocated for Baltic territories. The preparation of antiserum is costly and the formol vaccine would be much cheaper, but the 2–3 injections considered necessary are a great obstacle in view of the shortage of practitioners and vehicles and of the distances between the scattered farms. The simultaneous method should be carried out during the six weeks before the end of June, in order to confer immunity at the best time when the majority of the stock is old enough for inoculation. When possible, it is desirable to follow up the simultaneous inoculations with a second dose of culture 2–4 weeks later: this extends the period of immunity from five to twelve months.

II. W. refers to ROEMMELE [see I], who reported on the use of Russian formol vaccine against swine erysipelas in the then German-conquered eastern territories. Experiences from various parts including the Baltic States do not agree on the subject of the efficacy and hazards of the vaccine and W. advises a delay in forming an opinion on the question until further trials in progress are completed.—J. E.

GLEDHILL, A. W. (1945.) **The passive protection of mice against infection with *E. rhusiopathiae*.** —*J. comp. Path.* **55.** 93–108. **1492**

Effective protection followed the use of rabbit and horse immune sera only when these had been produced by means of repeated doses of living culture. Living cultures, whether of high or low virulence, were suitable as antigens in the production of effective sera. Cross-protection among the strains was complete as far as it was investigated, there being no evidence of strain specificity. The protective antibody in rabbit sera was distinct from the O-agglutinin and persisted after the latter had been absorbed.—J. K.

SAUTTER, J. H., POMEROY, B. S., & FENSTERMACHER, R. (1946.) **A case of pasteurella endocarditis in a pig.**—*J. Amer. vet. med. Ass.* **109.** 369–371. **1493**

A case of what appears to be atypical pasteurellosis is described in a 350 lb. sow which prior to death had a temperature of 106°F. for a period of 14 days. There was marked cyanosis and weakness. The most prominent finding P.M. was a vegetative endocarditis, together with evidence of septicaemia.

A Gram-negative organism was isolated from the spleen and heart lesions. The organisms killed a g. pig in 48 hours. Bipolar staining was demonstrated by Wright's stain and with methylene-blue. A phenolized antigen prepared from a 24-hour broth culture agglutinated serum from a rabbit immunized with an avian strain of pasteurella in dilution of 1 : 25, 1 : 50 and 1 : 100.

—D. LUKE.

EIGELSBACH, H. T., CHAMBERS, L. A., & CORIELL, L. L. (1946.) **Electron microscopy of *Bacterium tularense*.** — *J. Bact.* **52.** 179–185. [Authors' summary copied *verbatim*.] **1494**

The morphology of *Bacterium tularense* as determined with the electron microscope is in agreement with the systematic study of the morphology of this organism by means of vital staining techniques and dark-field examination reported by HESSELBROCK & FOSHAY [see *V. B.* **16.** 182.].

In general *Bacterium tularense* possesses multiple morphological units including large and small coccoid and bacillary, oval, minute, filamented, bean-shaped, dumbbell, bizarre, and so-called "involution" forms. The suggestion of the existence of minute morphological units of less than 300 mμ in diameter was confirmed. The typical cell possesses little opacity to the electron beam and presents a semitransparent nebulous appearance. Critical examination for the presence of a cell wall revealed an extremely delicate structure of very low electronic density which possibly accounts for the low survival rate when subjected to sonic vibration or the lyophilization process.

SJÖSTEDT, S. (1946.) **Pathogenicity of certain serological types of B. coli. Their mouse toxicity, hemolytic power, capacity for skin necrosis and resistance to phagocytosis and bactericidal faculties of human blood.**—*Acta path. microbiol. scand.* Suppl. No. 63. pp. 148. [In English.] **1495**

S. investigated the pathogenicity of some strains of *Bact. coli* with an established antigenic structure based on the schemes elaborated by KAUFFMAN (1943–45), KNIPSCHILDT (1945) and

VAHLNE (1945). With the material used he found that the capsular forms were on an average about seven times more toxic for mice than were the acapsular forms. The toxicity for mice, the capacity to produce necrosis in the skin of the rabbit and the haemolytic forms against horse red blood corpuscles were found to be closely related.

The acapsular types were found to undergo phagocytosis readily, while the capsular forms underwent phagocytosis to a slight degree only. Homologous OK serum increased phagocytosis, while sera containing homologous K antigen and heterologous O antigen were variable in this respect. Usually such sera caused considerable increase in phagocytosis, but in a few cases no apparent effect was noticed. K_1 was the commonest K antigen found occurring in 171 out of 461 strains of *Bact. coli* examined. K_5 occurred in 68 strains.

Different strains of *Bact. coli* varied greatly in their resistance to the bactericidal action of human blood. The resistance of a strain was not related to its toxicity.

The pathological significance of *Bact. coli* for man is discussed. As a result of his investigations, S. considers that strains of *Bact. coli* possessing a capsule, high toxicity for mice, strong haemolytic power, the capacity to produce skin necrosis and a high resistance to the defensive mechanisms of the body play some part in the pathogenesis of appendicitis, peritonitis and infections of the urinary tract.—D. LUKE.

GALLO, P. (1942.) Estudios sobre una nueva entidad nosográfica : " La artritis infecciosa de las aves, y su agente " : " La Escherichia Venezuelensis ", n. sp. [**Studies on a new disease, " Infectious arthritis in birds ", and its causal agent** *Escherichia venezuelensis*.]—*Rev. Med. vet. Parasit., Caracas.* **4.** 3–17. [Abst. from English summary.] **1496**

G. describes a disease of fowls which he calls " infectious arthritis ", one of the symptoms of which was swelling of the leg joint and plantar surface of the foot, and which could be transmitted experimentally by inoculation. In mice infection proved fatal but infected pigeons and other birds recovered spontaneously. In general the disease was similar to that described by NÓBREGA [see *V. B.* **12.** 404], but the causal agent, " *Escherichia venezuelensis* ", was different. The morphology and cultural characteristics of this organism are described.

OSBORNE, J. C., WITTER, J. F., & HITCHNER, E. J. (1946.) **A comparative study of cultures of micro-organisms involved in chronic coli-bacillosis in fowl.**—*M.*[*ich.*] *S*[*t.*] *C*[*oll.*] *Vet.* **6.** 25–29. **1497**

A résumé of the literature on the colon bacillus as a disease agent in the fowl is given. The cultural and morphological characters, the antigenic relationships and the pathogenicity of six strains were studied. Five were isolated from adult fowls and one from a duck with cholera-like symptoms. All proved pathogenic for rabbits and g. pigs on intraperitoneal inoculation.

Two birds six weeks old were inoculated with 1 ml. of each culture intraperitoneally. All had symptoms of illness within 24 hours. The organism was recovered from two birds which died. In three weeks the remainder had recovered, but remained unthrifty.

It is suggested that the status of freshly isolated strains of *Bact. coli* can be determined only by animal inoculation. The disease is said to resemble a type of fowl cholera and the so-called blue comb or pullet disease.—D. LUKE.

LINSBAUER, A. (1943.) Beitrag zur Epidemiologie der Paratyphus-Enteritis-Infektionen der Haustiere. [**Epidemiology of paratyphoid-enteritis infections in animals.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 191–194. **1498**

In a number of cases strains of the types *S. breslau*, *S. dublin* and *S. enteritidis* as well as five strains designated as *S. paratyphi B* were isolated from animals. The *S. breslau* infections occurred as isolated cases. Only one epidemic occurred in pigeons. *S. dublin* infections occurred mainly in calves. Among the five *S. paratyphi B* strains was one *S. schottmülleri* type, a second Schottmüller related to *S. abortus-bovis* and three Schleissheim strains. In one instance, chickens excreted a Schleissheim strain. According to local information no infections in human beings had taken place that could have been correlated to the animal infections mentioned. L. emphasizes the fact that the Schleissheim type is a mucoid type.—E. KLIENEBERGER-NOBEL.

ROLLE, M. (1944.) Das Bact. abortus equi als Krankheitserreger bei Pferden. [**Pathogenicity of** *Salmonella abortus equi* **in horses.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 317–318. **1499**

R. frequently isolated *S. abortus equi* not only from mares but also from geldings and occasionally from stallions and has obtained positive agglutination reactions at 1 : 400. Geldings in which infection was detected include serum producers, working horses on farms at which were infected mares, and horses on army service ; they included clinically healthy as well as diseased animals, in the latter cases usually associated with exhaustion from over-exertion or with respiratory disease

in one horse. The organism was isolated in pure culture from fistulous withers.

Experience has shown that healthy infected horses can rid themselves of this salmonella in the course of a few months. Mares which have aborted as a result of infection with this organism usually do not abort again during the next pregnancy.

R. considers that veterinary police measures to curtail this infection should be extended to include all horses.—J. E.

SCHOFIELD, F. W. (1946.) **Salmonella Typhimurium. A case of acute fatal enteritis among cattle.**—*Canad. J. comp. Med.* **10.** 271–273. [French summary.] **1500**

The outbreak described began among pregnant heifers stabled for the winter and spread to the cattle when five of the heifers were transferred to their barn. In the heifers the only symptom was a persistent diarrhoea and the three deaths which occurred took place 5–7 days after the onset of the disease. In the cattle two deaths occurred in 48–60 hours, with symptoms of depression, loss of appetite, scouring, a temperature of 103°–105°F., accelerated pulse and respiration and rapid decrease in milk. Sulfathalidine was given in maximum doses with good results. P.M. findings were acute congestion of the membranes of the gastro-intestinal tract, ulcers, sero-fibrinous exudate, congestion of the regional lymph nodes, kidneys and lungs. *S. typhi-murium* was recovered from the spleen, liver and heart blood in all cases examined, as well as from follicular abscesses in the heifer and from fibrinous exudate in the cattle. An autogenous bacterin was given to healthy contacts and no further cases occurred. Three of six samples of faeces examined for *S. typhi-murium*, were positive. S. believes this to be the first outbreak reported in North America of fatal enteritis among cattle due to *S. typhi-murium*.—J. L. BYRNE.

GORDON, R. F., & BUXTON, A. (1946.) **A survey of avian salmonellosis in Great Britain.** —*Vet. J.* **102.** 187–206. **1501**

The survey covers the years 1933–44 and is based on the records of the P.M. examinations on all species of poultry carried out at the Ministry of Agriculture's Veterinary Laboratory, Weybridge. Complete typing of all the salmonella organisms isolated was not begun until 1943, when a marked increase occurred in the variety of salmonella found. The biochemical and serological tests used at the laboratory are described.

Out of 6,578 groups of chicks, ducklings, pheasant chicks, turkey poults and goslings examined, 4·1% were infected with salmonella organisms other than *S. pullorum* and *S. gallinarum*. Prior to 1943, the only species isolated were *S. pullorum*, *S. gallinarum*, *S. typhi-murium* and *S. enteritidis*. Since 1943 the following strains have been isolated :– *S. thompson*, *S. california*, *S. bareilly*, *S. montevideo* and *S. anatum*; *S. london* was found by the authors in chicks after completion of the survey.

The public health aspects of avian salmonellosis are stressed. Possible methods of dissemination and the difficulties of control are discussed.

The danger that infected imported dried egg may be spread to poultry and infection spread among flocks is discussed.—D. LUKE.

SAXER, E. (1945.) Neuere Erfahrungen auf dem Gebiete der Bruzellosen. [**Recent advances in the study of brucellosis.**]—*Schweiz. Arch. Tierheilk.* **87.** 316–327. **1502**

This is a lecture on recent developments in various parts of the world, together with a recital of well-known facts. Interesting points include the finding in Switzerland of brucella infection of the intervertebral disks in swine with signs of backbone fracture, and figures on brucella infection in human beings during 1937–44, cases numbering 119–157 annually, with 1–8 deaths. —J. E.

ENDRESS, R. (1940.) Die Agglutinationsmethode nach Stableforth und Willems zur Feststellung der Rinderbruzellose. [**The agglutination methods of Stableforth and Willems for the detection of bovine brucellosis.**]—*Z. InfektKr. Haustiere.* **56.** 297–320. **1503**

At a meeting the *Office Internationale des Epizooties* in Paris in 1937 it was suggested that, with the exception noted below the agglutination method described by STABLEFORTH [see *V. B.* **7.** 184] and WILLEMS [see *V. B.* **8.** 163] should be introduced as a standard method for the diagnosis of brucellosis in cattle. E. made an extensive comparison of this method and those used in Germany, such as the aggln. tests, the Meinicke turbidity test and the complement fixation reaction. According to E., the German methods are equally reliable and the differences in the results obtained by the various methods are negligible. E. is of opinion that a mixture of several strains of *Br. abortus*, tested for suitability, should be used for the preparation of the antigen and he considers that a suspension prepared of one strain only, is insufficient.

—E. KLIENEBERGER-NOBEL.

STÄHELI. (1944.) Bericht über die Tätigkeit der Abortus-kommission der Gesellschaft Schweizerischer Tierärzte von 1937–1943. [**Report of the Bovine Brucellosis Commission of the Swiss Veterinary Society, 1937-43.**]—*Schweiz. Arch. Tierheilk.* **86.** 209–216. **1504**

This is a progress report. Until 1941, bovine contagious abortion was virtually uncontrolled in Switzerland, as the measures instituted in 1935 had very little effect. It was the purpose of the Commission to introduce improvements and in this, attention was paid mainly to the standardization of the slow serum agglutination test and to vaccination. Owing to the war there were delays in introducing the former and in obtaining dry serum as described by Stableforth to act as a standard for one of Swiss production. Immunization in Switzerland with a live *Br. abortus* vaccine having proved disappointing, a move was made to obtain the American strain 19. Up to 1944, vaccination with this culture had been carried out on 1,500 Swiss cattle, but there had not yet been sufficient evidence for its general adoption to be advocated.

An attempt to control infertility in cattle was also made by vitamin E therapy, but there was no reduction in the abortion rate or increase in live birth rate.—J. E.

ELDER, C. (1946.) **Transmission of *Brucella suis* from swine to cattle under pasture conditions.** —*Res. Bull. Mo agric Exp. Sta.* No. 398. pp. 15. **1505**

To test the possibility of swine transmitting brucella infection to cattle under pasture or farm conditions, eight cows were kept in close contact with pigs which had been artificially infected with *Br. suis*. The presence of the infection was demonstrated in these swine and also in pigs which had previously been negative, but which had been placed in contact with them. Three abortions occurred in the cattle, but all were negative to examinations for brucella. Several of the cows developed low agglutination titres, varying from negative to 1 : 160, but no proof was obtained that these titres were due to *Br. suis*. —S. J. GILBERT.

KING, R. O. C. (1945.) **Notes on recent research work with Brucella suis infection.**—*Yearb. Inst. Insp. Stk, N.S.W., 1945.* Reprint pp. 4. **1506**

Attention is drawn to the variable effects of infection with *Br. suis* in the boar. A case is cited in which the boar was infected and fully potent but did not transmit his infection to sows. Comparatively few boars have clinical evidence of infection, but an infected boar frequently excretes *Br. suis* in its semen. In two infected boars erection of the penis was absent although normal sexual desire was present. One case of death probably due to *Br. suis* is described. *Br. suis* infection may be carried through from youth to maturity in the bodies of pigs. K. stresses that persistent suspicious reactions to the agglutination test must be regarded as positive. In conclusion, the public health aspects of *Br. suis* infection are discussed.—D. F. STEWART.

ASCOLI, A. A. (1946.) **Susceptibility of female rat to brucellosis.**—*Vet. Med.* **41.** 396–397. **1507**

During experiments on the protective power of sera of vaccinated and naturally infected cattle, it was observed that female albino rats died earlier than males following intraperitoneal inoculation with virulent culture. Of 81 males 65·4% succumbed at an average of 3·6 days after inoculation, whilst of 60 females 91·7% succumbed at an average of two days. The lower resistance of females was confirmed in later tests, the lethal dose proving to be $\frac{1}{2}$–$\frac{1}{3}$ that required for males. Older female rats were found to be more susceptible than younger females.—S. J. GILBERT.

KELLAWAY, C. H., REID, G., & TRETHEWIE, E. R. (1941.) **Circulatory and other effects of the toxin of *Cl. septique*.**—*Aust. J. exp. Biol. med. Sci.* **19.** 297–309. **1508**

Following intravenous injection in the cat and the rabbit, *Cl. septicum* toxin has a specific cardiac action, shown by a fall in systemic blood pressure and a rise in cardiac pressure. The toxin has a direct action on the heart and causes constriction of the coronary and pulmonary circulations, the latter being marked in the cat, and leading to pulmonary oedema. In the rabbit, but not in the cat, there is an initial peripheral vasoconstriction, causing a transient rise in systemic blood pressure. In the cat, but not in the rabbit, injection into the vessels supplying the adrenals causes the liberation of adrenalin, possibly as a result of the preliminary liberation of histamine.

The systemic effects in the rabbit also occur after section of the splanchnic nerves, after decapitation and after evisceration combined with adrenalectomy.

Histamine is liberated from the isolated perfused lungs of the g. pig, and pigment and adenyl compounds, together with an inactivating enzyme, from the perfused liver of the rabbit.

The toxin causes specific contraction after a long latent period and slow relaxation in the isolated jejunum of the g. pig and in the uteri of the virgin g. pig and rat.—A. W. BANKS.

CHRISTIE, R., & WILSON, H. (1941.) **A test of staphylococcal fibrinolysis.**—*Aust. J. exp. Biol. med. Sci.* **19.** 329–332. **1509**

The authors studied the lysis, by 141 human and 57 animal strains, of heat-precipitated fibrinogen incorporated in nutrient agar. It is concluded that in general the factor responsible for this fibrinolysis is associated with coagulase and α-toxin, and is inhibited, or its effects masked,

by β-toxin; hence, clearing of fibrinogen agar is a good indication of pathogenicity in human strains, which rarely produce much β-toxin, but not with animal strains, which produce β-toxin comparatively frequently.—A. W. Banks.

Buer, A. W. (1946.) **A method for production of high-titre tetanus serum.**—*Acta path. microbiol. scand.* **23.** 293–298. [In English.] [Abst. from author's summary.] **1510**

B. used a modification of Ramon's method (the use of an emulsion of olive oil, lanoline and tetanus toxin or toxoid) for the production of tetanus antiserum, an inflammation-infiltrate being produced. He then made an injection into the inflammation-infiltrate when 3–4 days old. By this means the titre was raised manifold, titres of up to between 4,000 and 4,800 I.U. per ml. being obtained.

Traub, F. B., Hollander, A., & Friedemann, U. (1946.) **The potentiation of tetanus toxin by broth and serum.**—*J. Bact.* **52.** 169–177. **1511**

Some culture filtrates of *Cl. tetani*, when tested in mice and g. pigs for their M.L.D., were found to have their potency markedly enhanced if the dilutions were prepared not in saline but in certain diluents, as, for example, serum, peptone water and broth. The activity of weak toxins could be increased 64-fold and even broth in a dilution of 1 : 1,000 was active in some instances. This qualitative difference among tetanus culture filtrates has not yet been connected with their variable characters, such as their avidity for nerve tissue, or their g. pig : rabbit ratio.—J. Keppie.

Abrams, A., Kegeles, G., & Hottle, G. A. (1946.) **The purification of toxin from *Clostridium botulinum* Type A.**—*J. biol. Chem.* **164.** 63–79. **1512**

Large batches of *Cl. botulinum* whole culture, grown in a tryptic digest of casein medium, were successfully concentrated and purified to enable the isolation of a protein having the specific properties of *Cl. botulinum* toxin. The technique adopted was acid precipitation, followed by repeated additions of phosphate buffer and fractionation with sodium sulphate or alcohol. Much of the work was carried out at 0°–4°C. It was shown that the crude toxin was rapidly destroyed in a medium with pH above 7·0 and by temperatures higher than 60°C. The final purified preparation was shown to have the properties of a protein. It was electrophoretically homogeneous, and had 220 million mouse M.L.D., per mg. N, after the second crystallization.—J. K.

Krasnobaev, A. K. (1940.) Plastinchatye kul'tury palochki nekroza. [**Plate cultures of the necrosis bacillus.**]—*Veterinariya, Moscow.* No. 4. pp. 18–26. [French summary.] **1513**

K. records his experiences of growing *Actinomyces necrophorus* in plate cultures. His first attempts at growing the organisms on plates in evacuated desiccators or in agar bottles under H_2 were abandoned as unsatisfactory. Fortner plates were found to be very suitable. The medium used was 3% nutrient agar of pH 7·2–7·4, with 8–12% defibrinated blood of sheep or reindeer. One-half of the plate was incubated with *A. necrophorus* or the material suspected of containing it, the other half with a strictly aerobic organism; yellow sarcinae were the most suitable. The inoculum of the aerobe must be copious and from a fresh culture to assure rapid good development. The plates were sealed with warm plasticin and incubated at 37°. Growth of *A. necrophorus* became visible usually after 36–48 hours and was fully developed after 4–8 days. No growth was obtained if there was any access of air. Thirty-six strains isolated from reindeer with hoof disease, one from sheep, and two from cattle were studied and their morphological and cultural characteristics are described in great detail. A plate method for the isolation of *A. necrophorus* is important, as under natural conditions and even after a rabbit passage the organism is usually mixed with contaminants. The method described can be used in circumstances where equipment, transport and so on would make other methods impossible, *e.g.*, in mobile laboratories. The work described was done in the tundra where K. studied necrobacillosis of the reindeer.

In addition to its value for the isolation and purification of *A. necrophorus*, the method seems to have a rejuvenating influence on old laboratory strains. When the cultures were regularly plated there was no loss of virulence in any stock strain for four years.—A. Mayr Harting.

Sprince, H., & Woolley, D. W. (1945.) **The occurrence of the growth factor streptogenin in purified proteins.**—*J. Amer. chem. Soc.* **67.** 1734–1736. [Reprinted in *Stud. Rockefeller Inst. med. Res.* **129.** 119–124.] **1514**

Streptogenin, a bacterial growth factor, occurs in partial hydrolysates of vitamin-free casein, crystaline insulin, and crystaline proteins such as trypsins, trypsinogens, tobacco mosaic virus and haemoglobin. Dialysed egg-white, salinine and gelatin give very little streptogenin. The factor has been concentrated by differential extraction and precipitation procedures.—E. Boyland.

See also absts. **1553** (staphylococcus anatoxin), **1586** (tuberculin test), **1624** (X-ray effect on *Bact. col*), **1627-1629** (pneumococcal pneumonia), **1632-1633** (arginine requirements of streptococci), **1634-1635** (sulphonamides), **1639** (penicillin and *Bact. equirulis*), **1640-1642** (penicillin and mastitis), **1644, 1645** (streptomycin), **1661** (food poisoning by staphylococcus), **1662** (*S. dublin* infection), **1674-1679** (technique).

DISEASES CAUSED BY PROTOZOAN PARASITES

ZUCKERMAN, A. (1945.) **In vitro opsonic tests with *Plasmodium gallinaceum* and *Plasmodium lophurae*.**—*J. infect. Dis.* **77.** 28–59. **1515**

The mechanism of immunity and the demonstration of antibodies in the blood stream in malaria are discussed, and experiments are described which demonstrate that circulating opsonins are present in the serum of fowls hyperimmunized against *P. gallinaceum* and *P. lophurae*.

The technique involved the growing of macrophages in culture tubes, the bottom of which had been removed and replaced by a cover-slip. Antigen and test serum were added to the culture and after incubation the culture was fixed *in situ*. The amount of phagocytosis was estimated by removing and staining the cover-slip and examining it microscopically. Full details of this technique are given. Circulating antibody against normal and parasitized red cells was demonstrated in hyperimmune sera, but was not found in immune sera from birds recovering from initial infections.—M. C.

DAVEY, D. G. (1946.) **Concerning exoerythrocytic forms and the evidence for their existence in human malaria.**—*Trans. R. Soc. trop. Med. Hyg.* **40.** 171–182. **1516**

D. gives a brief survey of human malaria from the point of view of the laboratory worker searching for more efficient drugs for its therapy and control. Drugs which are particularly required are those for causal prophylaxis, *i.e.*, drugs which prevent parasites appearing in the red blood cells. Causal prophylaxis and radical cure of bird malaria are closely bound up with the chemotherapy of the exo-erythrocytic forms. No certain demonstration of these forms has yet been made in human malaria, but the results of subinoculation experiments and the effects of drugs suggest their presence.—C. H. S.

WOLFSON, F. (1946.) ***Plasmodium elongatum* in the Pekin duck.**—*Amer. J. Hyg.* **44.** 268–272. **1517**

This strain of *P. elongatum* was inoculated into the duck from a canary and underwent over 40 intravenous subinoculations at frequent intervals. No increase in parasitaemia was observed in the peripheral blood after ten rapid transfers. Two peaks of parasitaemia occur during the course of infection, one during the first and the other during the second week after inoculation. Parasitaemia at its peak remained below 10% of infected erythrocytes after as many as 3,000 million parasites per kg. had been received. Only 27% of ducks receiving this number of parasites survived for 16 days after inoculation. Infected ducks developed severe anaemia. The parasites can be preserved in duck blood by low-temperature freezing.—C. HORTON SMITH.

HAWKING, F. (1946.) **Growth of protozoa in tissue culture. II. *Plasmodium relictum*, exo-erythrocytic forms.**—*Trans. R. Soc. trop. Med. Hyg.* **40.** 183–187. Discussion pp. 187–188. [For part I, see *V. B.* **16.** 138.] **1518**

H. gives a description of the growth of the exo-erythrocytic form of *P. relictum* in tissue cultured by the technique previously described [see *V. B.* **16.** 138]. The technique is valuable for studying the structure of exo-erythrocytic forms and especially of those stages leading up to schizogony and the formation of merozoites, which in this species attain their elongated form at an early stage of schizogony. Fluid removed from the culture flasks after five and nine days was infective for a canary. Penicillin and streptomycin did not interfere with growth.—C. H. S.

WOLFSON, F., & CAKRTOVA, M. (1946.) **Relationship between the number of parasites and parasitized erythrocytes in avian and simian malaria.**—*Amer. J. Hyg.* **44.** 301–311. **1519**

Statistical evidence indicates a definite relationship between the values of the number of parasites per 100 cells and the percentage of parasitized cells. The existing relationship is determined by the Poisson series which arises when the distribution of parasites in the erythrocytes of the peripheral blood is random. The collected data suggest that the characteristic is general, but not in the case of *P. cathemerium* or *P. relictum* after long residence or when preserved by freezing. In *P. lophurae* it persists after at least three years' residence in the host. Nevertheless, the study of this relationship may afford an additional criterion for assessing the behaviour of the parasite under varying conditions, and further investigation is indicated.—C. HORTON SMITH.

WOLFSON, F., & WINTER, M. W. (1946.) Studies **of *Plasmodium cynomolgi* in the rhesus monkey, *Macaca mulatta*.**—*Amer. J. Hyg.* **44.** 273–300. **1520**

A study was made of the host-parasite relationship existing between *P. cynomolgi* and the rhesus monkey (*Macaca mulatta*). Aspects investigated included the transmission of infection by mosquitoes, gametocyte counts, the effect of dose on parasitaemia in blood-transmitted infections, anaemia during primary attack, periodicity in asexual reproduction, relapses, latent infections, recoveries, reinfections of recovered animals, deaths and preservation of parasites by low-temperature freezing. *Anopheles quadrimaculatus* can transmit this strain of *P. cynomolgi* by either intravenous or subcutaneous inoculation of sporo-

zoites as well as by bites of infected mosquitoes.

Mosquito-transmitted infections resemble those transmitted by blood, but the prepatent period of the latter is much shorter. Gametocyte counts show that approximately 90% of infected monkeys are possible donors for mosquito infections, at least on one day of their acute infection. The length of the prepatent period becomes shorter as the dose is increased. A convenient standard dose for intravenous blood inoculation is 100 million parasites per kg. body weight; this produces infections in which parasites are present in thick films on the day following inoculation. The peak is reached between 6–8 days after inoculation; the peak of anaemia occurs 7–9 days following the peak of parasitaemia. There is a temperature rise for at least two days during the primary attack. Very few monkeys show typical tertian periodicity uncomplicated by secondary broods of segmenting parasites. There are daily morning temperature fluctuations in most synchronous infections which are probably related to the periods of segmentation of the parasites. Severe relapses may occur. No parasites are observed ten months after inoculation. Intravenous subinoculations of blood of infected monkeys giving negative results, splenectomy producing no relapse, and reinoculation with homologous strains causing infection, all afford evidence of complete recovery at the beginning of the fourth month after inoculation. Reinoculation of rhesus monkeys spontaneously recovered from *P. cynomolgi* infection produces an infection which differs from the normal only in the length of the patent period. To maintain the parasite in monkeys, infection must be transmitted at least every six months. The parasites can be preserved by low-temperature freezing.

—C. Horton Smith.

Sofiev, M. S., & Leonova, N. A. (1945.) Nov'ie dann'ie o rezervuarats virusa kdeshchevogo rekurrensa v Uzbekskoĭ SSR. **[New data on the reservoirs of the virus of tick-borne relapsing fever in the Uzbek Soviet Socialist Republic.]** —*Med. Parazitol., Moscow.* **14.** 60–65. [Abst. in *Trop. Dis. Bull.* **43.** 744, copied *verbatim.* Signed: C. A. Hoare.] **1521**

This paper is devoted to a study of the reservoir hosts of tick-borne relapsing fever in Fergana (Uzbekistan). Previously the following animals have been found, in Middle Asia, to be naturally infected with spirochaetes of relapsing fever: dogs, rats (*Rattus turkestanicus*), gerbils (*Rhombomys opimus* and *Gerbillus eversmanni*), bats (*Rhinolophus ferrumequinum*) and mice (*Mus musculus severtzovi*). In Fergana the principal reservoir hosts were found to be mice, 6 per cent. of which proved to be naturally infected. The duration of the disease in these rodents is 12–28 days, and it is thought that in the course of the summer, probably all the mice became infected. In view of their constant migrations, it is suspected that mice serve as carriers of infected ticks (*Ornithodorus papillipes*) from house to house, thus serving to disseminate relapsing fever. Experimental infections with spirochaetes obtained from mice proved that they were identical with the spirochaete isolated from man.

As regards the spirochaetes of relapsing fever in gerbils (of which up to 17 per cent. are naturally infected), these differ from the human strains in various biological characters (*e.g.*, virulence for guinea pigs), and have a distinct vector, *O. tartakovskyi*, on account of which they are regarded as an independent species, *S. latyschevi* Sofiev, 1941.

Senthille, F., de Bayo, P., & Kolochine-Erber, B. (1945.) Premiere observation en France d'une infecion à *Leptospires* sur des chiens ayant contaminé leurs maitres. **[Two cases of *Leptospira canicola* infection in man contracted from dogs.]**—*Bull. Acad. vét. Fr.* **18.** 176–184. Discussion pp. 185–186. **1522**

Sera from a man and his wife who contracted an influenza-like disease with nervous symptoms gave positive agglutination reactions for leptospira, the titres being highest for *L. canicola.*

Their four dogs, although apparently healthy, gave positive aggln. reactions for *L. canicola* and in two animals leptospira were demonstrated in the urine. It is suggested that a five-month-old puppy had been infected from birth, parturition having caused in its dam a relapse to a chronic leptospirosis. The owners had become infected in nursing the bitch after parturition, or in fondling the puppy. Attention is drawn to the absence of clinical symptoms in the dogs.

—U. F. Richardson.

See also abst. **1647** (antimalarial substances), **1680** (technique for staining *Trichomonas*).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Wirth, D. (1946.) Tollwut des Hundes. **[Canine rabies.]**—*Wien. tierärztl. Mschr.* **33.** 127–130. **1523**

W. gives a short account of the clinical signs and diagnosis of rabies in dogs. During the 1914–18 war more than 400 cases of rabies in dogs occurred at his clinic in Vienna, whereas there were only two cases from 1939 to 1945.

[The reasons for this decline in the number of cases seen by him are not made clear.]—W. M. H.

ROTTGARDT, A. A. (1945.) Rabia paralitica de los bovinos en la Argentina. [**Bovine paralytic rabies in the Argentine.**]—*Bol. mens. Direcc. Ganad., Montevideo.* **28.** 90–112. **1524**

R. reviews the literature on bovine paralytic rabies, with special reference to the Argentine. Its history, geographic distribution, aetiology, differential diagnosis, symptomatology, histology, pathology, experimental reproduction, morbidity, its bat vectors and their geographical distribution and experimental infection and its prophylaxis by means of carbolic, chloroform vaccines are all discussed.

In Argentine, between 1931 and 1942, 718,542 cattle and 19,820 horses were vaccinated with the chloroform vaccine, with a decrease in morbidity from 36·0 to 1·5%. The disease has now practically disappeared, remaining only in limited areas, where the vaccination is being carried out.

Vaccination is successful if carried out within eight days of the bat's bite. Six inoculations of 20–40 ml. of vaccine each are made every second day. Alternatively a single dose of not less than 150 ml. in two sites can be given. Both methods have rendered good results in suitable cases.—H. G. ARAMBURU.

IDNANI, J. A. (1943.) **Pox in farm animals.**—*Indian Fmg.* **4.** 362–363. **1525**

The author reviews the history of pox in farm animals the relationship between pox diseases in different species and the preventive measures necessary. A brief description is given of the symptoms and lesions in various species.—C. S.

DE BLIECK, L., & JANSEN, J. (1946.) Pokken bij de kalkoen. (Voorloopige mededeeling.) [**Pox diseases in turkeys. Preliminary report.**]—*Tijdschr. Diergeneesk.* **71.** 609–612. [English summary slightly amended.] **1526**

A pox virus was isolated from diseased turkeys that was pathogenic for chickens and pigeons, but not for canaries.

Cross-immunity was demonstrable with fowl pox virus, but not with pigeon pox virus.

TAYLOR, A. R., SHARP, D. G., MCLEAN, I. W., Jr., BEARD, D., BEARD, J. W., DINGLE, J. H., & FELLER, A. E. (1944.) **Purification and character of the swine-influenza virus.**—*J. Immunol.* **48.** 361–379. [See also *V. B.* **14.** 120, 193 & 269.] **1527**

Swine influenza virus was purified by methods similar to those adopted for influenza viruses A and B respectively. Infected allantoic fluid was concentrated by adsorption on chick red blood cells and eluted for six hours (30 min. at 37°C., and 5½ hours at 25°C.). Further concentrations to 204 times that of the original fluid was effected by spinning in the ultra-centrifruge at 20,000 g. for one hour. Sediment velocity diagrams of the purified preparations showed a single diffuse boundary which had a concentrate containing 0·31 mg. of nitrogen per ml. and gave a figure of $S_{20°} = 662 \times 10^{-13}$ and an average partical diameter of 81·5 m. Similar concentrations examined by electron microscopy had round or ovoid structures with an average diameter of 78·3 m.

Chemical tests on the concentrates gave positive Biuret ninhydrin and Millon reactions, but the glyoxylic-acid test was negative. Other reactions indicated the presence of nucleic acid of the desoxypentose type. The values for carbon nitrogen and phosphorous were 51·35 and 9·0 and 0·87% respectively. The carbohydrate content was 10%.—R. E. GLOVER.

SMITH, M. G., BLATTNER, R. J., & HEYS, F. M. (1946.) **St. Louis encephalitis. Infection of chicken mites, Dermanyssus gallinae, by feeding on chickens with viremia; transovarian passage of virus into the second generation.**—*J. exp. Med.* **84.** 1–6. [Authors' summary copied *verbatim.*] **1528**

A colony of chicken mites (*Dermanyssus gallinae*) was established from a single adult female mite and her offspring. This colony of mites was shown to be free of the virus of St. Louis encephalitis. Infection of mites from this homogeneous colony with the virus of St. Louis encephalitis was accomplished by feeding on chickens having viremia. The virus was recovered as readily from mites which had not been allowed to feed for 8 days as from mites freshly engorged, showing that the demonstration of virus in the mites does not depend on the presence of fresh infective chicken blood. Transovarian passage of the St. Louis virus into the second generation has been demonstrated in mites infected experimentally. The female mite infected as an adult can pass the St. Louis virus through eggs laid after additional feeding on normal blood. Persistence of the virus for a period of 6 months has been shown in a colony of mites infected experimentally in the laboratory.

KOPROWSKI, H., & LENNETTE, E. H. (1946.) **Effect of *in vitro* cultivation on the pathogenicity of Venezuelan equine encephalomyelitis virus.**—*J. exp. Med.* **84.** 205–210. [Authors' summary copied *verbatim.*] **1529**

Continued *in vitro* cultivation in a Maitland type medium resulted in a marked modification of the extraneural pathogenicity of the Venezuelan equine encephalomyelitis virus.

The ability of the virus to induce lethal infections after peripheral inoculation was almost completely lost for mice 42 or more days of age, was somewhat reduced for mice 28 days of age, but was still retained for mice 21 or less days of age. The virulence of the virus by the cerebral route remained essentially unaffected for mice of any of the experimental age groups.

Prolonged cultivation also resulted in almost complete attenuation of the virus for rabbits and guinea pigs by the intraperitoneal route.

STEIN, C. D., & MOTT, L. O. (1946.) **Suspected equine infectious anemia in man.**—*Vet. Med.* **41.** 385–388. **1530**

The possibility of human infection with the virus of E.I.A. is discussed. Two cases in man in Europe have been recorded by LUHRS [(1920.) *Z. Veterinark.* **32.** 89–95] and PETERS [(1924.) *Pr. Méd.* **32.** 105–106].

The blood of two suspected cases in man in the U.S.A. was injected into two susceptible horses, neither of which developed E.I.A.—M. C.

BANKIER, J. C. (1946.) **Equine infectious anaemia. Attempted cross immunity experiments.**—*Canad. J. comp. Med.* **10.** 274–276. [French summary.] **1531**

An attempt was made to determine whether horses immunized with lymphocytic choriomeningitis [L.C.M.] or equine encephalomyelitis virus (Western type) developed an immunity to the virus of equine infectious anaemia.

Nine horses were given graduated doses of L.C.M. virus with no apparent ill-effects. All but one were challenged 90 days later with the virus of E.I.A. Only two survived and these had characteristic periodic temperature rises. A tenth horse immunized previously with a different strain of L.C.M. virus and crystal violet tissue vaccine prepared from cases of E.I.A. survived. Two horses immunized two years previously with live E.E. virus were challenged similarly and both died. There appeared to be no development of cross immunity.—J. L. BYRNE.

KRESS, F. (1946.) Versuche zur Bekämpfung des virus bedingten Abortus beim Pferde mit Organvakzine. [**A formolized vaccine against virus abortion in mares.**]—*Wien. tierärztl. Mschr.* **33.** 121–126. [English, French and Russian summaries.] **1532**

A vaccine against virus abortion in mares was prepared by taking the heart, lung, liver, spleen, kidney, stomach and the pleural and peritoneal cavity fluids from aborted foetuses. A 1 : 4 suspension was made of these tissues with physiological saline solution and 4 ml. of formalin per litre were added. [In the summaries the resulting concentration of formalin is quoted as being 4% and not 0·4%.] The vaccine was then incubated for two periods of 48 hours at 37°C., being then described as non-infective. The dose for mares is 30 ml., given subcutaneously, followed 8–10 days later by 40 ml. subcutaneously. The use of this vaccine on a limited scale is claimed to have reduced the incidence of virus abortion from 30 to 2%.—W. M. HENDERSON.

KRESS, F. (1946.) Über virusbedingten Abortus bei Pferdestuten; Versuche zum Virusnachweis. [**Inclusion bodies in virus abortion in mares.**]—*Wien. tierärztl. Mschr.* **33.** 18–28. [English, French and Russian summaries.] **1533**

Examination of Victoria Blue-stained preparations of secretions from the uterus, vagina, eyes and nose of a virus-infected aborting mare, the tissues and fluids of the aborted foetus, the tissues and secretions of experimentally infected g. pigs, the chorio-allantoic membrane of experimentally infected eggs and the secretions of an experimentally infected mare and its foal revealed the presence of granular bodies which were not found in four healthy foetuses, five aborted foetuses due to paratyphoid infection and three aborted foetuses due to streptococcal infection. It is concluded that these granular forms are specific inclusion bodies of the virus infection.—W. M. H.

GALLO, P. (1942.) Primeros estudios sobre un nuevo agente etiológico: el virus de la neumoenteritis (Peste Boba) de los terneros. [**A new aetiological agent: the virus of pneumoenteritis in calves.**]—*Rev. Med. vet. Parasit., Caracas.* **4.** 31–34. [Abst. from English summary.] **1534**

G. describes a virus isolated from calves with pneumo-enteritis. He considers it the true agent of the disease, lowering resistance to secondary infection. Transmission of the virus was only possibly intranasally. In preliminary experiments it had little pathogenicity for mice and piglets.

WILSON, D. R. (1946.) **Studies in louping-ill. III.—Louping-ill antiserum.**—*J. comp. Path.* **56.** 78–100. [For previous parts, see *V. B.* **17.** 77.] **1535**

Louping-ill antisera were obtained from sheep which had been hyperimmunized by subcutaneous or intramuscular injections of brain virus or of virus cultivated in chick embryo tissue plus Tyrode's fluid. In horses, brain virus produced troublesome local reactions which did not occur when culture virus was used. Titration of the sera was carried out by intracerebral injection of serum-virus mixtures in mice, by adding serum to virus in tissue culture medium, or by *in vivo* neutralization of virus in sheep. Sera tested by their inhibitory action upon growth of virus in culture medium were about 20 times more potent

than when tested as *in vitro* mixtures of serum-virus by intracerebral injections in mice, and it is suggested that this phenomenon is due to the absence of any but nervous tissue cells in the intracerebral injection method, compared to the various types of cells which may facilitate rapid formation of antigen antibody molecules in tissue culture.

Sheep were protected by serum from thermal reactions following the subcutaneous injection of large doses (probably >100,000 M.I.D.) of virus: this was due to the inhibition of virus multiplication in visceral tissues. Since this prevented invasion by the virus of nervous tissue, however, these sheep succumbed to subsequent intracerebral inoculations of virus, whereas sheep which had been infected with virus alone developed an immunity to intracerebral inoculations.

—G. B. S. HEATH.

GWATKIN, R., & MITCHELL, C. A. (1944.) **Studies on swine fever. II. Search for carriers in vaccinated and exposed animals.**—*Canad. J. comp. Med.* **8.** 350–353. [For part I, see *V. B.* **15.** 294.] **1536**

A total of 21 pigs which had received crystal violet vaccine and had survived a subsequent exposure to infection by contact with a pig inoculated with the virus of swine fever, were used in these experiments.

In the first, one pig was thoroughly washed 22 days after exposure and put in a clean pen. One week later, a normal pig was placed in the same pen and left there two months. Both pigs remained healthy. The vaccinated pig was killed and a suspension of its organs, blood, skin and marrow was injected into three unexposed pigs with no apparent ill effects.

In the second experiment, 20 pigs from four groups were washed 33 days after exposure and transferred to clean pens. One pig from each group was killed and suspensions of their organs were inoculated into unexposed pigs; again, no ill effects occurred. Following another washing, ten unexposed pigs were added to the clean pens containing 16 of the vaccinated animals and left there 32 days. One contact pig and two vaccinated pigs died. Possibility of virus infection in the contact animal and one of the vaccinated animals was excluded by inoculation of organ suspensions into unexposed animals. The other vaccinated animal was in good condition and died suddenly during hot weather; decomposition prevented animal inoculation, but P.M. findings and absence of infection in contacts ruled out virus. Inoculation of unexposed pigs with pooled organ suspensions from the remaining 14 vaccinated animals killed 68 days after exposure gave negative results.—J. L. BYRNE.

MICHALKA, J. (1946.) 11 Jahre Schweinepest-bekampfung in Osterreich. **[Control of swine fever in Austria.]**—*Wien. tierärztl. Mschr.* **33.** 62–70. [English and French summaries.] **1537**

The incidence of swine fever during 1928–29 is reviewed. In each year the incidence was lowest from April to May and highest in November.

Following a severe epidemic in 1928 prophylactic double inoculation and also serum inoculation of infected pigs was used. At first the results of double inoculation were not satisfactory on account of the too severe reactions and because some of the inoculated pigs became carriers of viruses. By increasing the dose of serum and using a virus with a short incubation period (60 hours) much better results were obtained. Regulations were introduced restricting the use of either serum or virus to (1) infected herds, (2) herds where there was evidence of chronic infection, (3) sucking piglets in herds which had been inoculated previously, (4) mass inoculation of herds in infected villages and (5) fattening establishments. Of 14,309 direct contacts in infected herds the mortality was 14·5%. Of 523 sick pigs inoculated with serum 75·3% died. In 5,031 sucking piglets inoculated with serum no losses occurred, but the continuance of this practice was not advised as M. considered that over a period of years a highly susceptible pig population would result.

When sows advanced in pregnancy were immunized, there was an increase in the percentage of stillborn piglets.—M. C.

MÜSSEMEIER. (1940.) Die ansteckende Schweinelähme (Teschner Krankheit, Meningo-Encephalomyelitis enzootic suum) und ihre Bekämpfung. **[Porcine encephalomyelitis (Teschin disease, meningo-encephalomyelitis enzootica suum) and its control.]**—*Berl. Munch. tierärztl. Wschr.* May 31st. 253–256. **1538**

M. reviews facts, as known in 1940, about porcine encephalomyelitis and includes references to the work, some of which was then unpublished, of BAUMANN, KMENT, FINGERLOS, FORTNER and the staff of the Modling Institute, Vienna. [This work has now been published and the review no longer contains any new information—see *V. B.* **12.** 86, 275 & 411 and **16.** 69.]—W. M. H.

—. (1946.) **[Discussion on] The "cat influenza" and "cat distemper" group.** [Speakers:—KON, P., LOVELL, R., & LEVI, M. L.]—*Vet. Rec.* **58.** 358. **1539**

This is a general discussion on the subject, presenting no new knowledge.—A. R. JENNINGS.

RISER, W. H. (1947.) **The behavior of the peripheral blood elements in panleucopenia**

(agranulocytosis) of the domestic cat.—*Amer. J. vet. Res.* **8.** 82–90. **1540**

R. states that feline agranulocytosis can be accurately diagnosed by means of blood examinations. Differential leucocyte counts are said to be of prognostic value. Post-crisis blood examinations reveal a high percentage of immature leucocytes.—A. R. JENNINGS.

I. JUNGHERR, E. L., TYZZER, E. E., BRANDLY, C. A., & MOSES, H. E. (1946.) **The comparative pathology of fowl plague and Newcastle disease.**—*Amer. J. vet. Res.* **7.** 250–288. **1541**

II. BRANDLY, C. A., MOSES, H. E., JUNGHERR, E. L., & JONES, E. E. (1946.) **The isolation and identification of Newcastle disease virus.**—*Ibid.* 289–306. **1542**

III. BRANDLY, C. A., MOSES, H. E., JONES, E. E., & JUNGHERR, E. L. (1946.) **Immunization of chickens against Newcastle disease.**—*Ibid.* 307–332. **1543**

IV. BRANDLY, C. A., MOSES, H. E., & JUNGHERR, E. L. (1946.) **Transmission of antiviral activity via the egg and the rôle of congenital passive immunity to Newcastle disease in chickens.**—*Ibid.* 333–342. **1544**

I. The authors review the literature on the symptomatology and pathology of fowl plague and Newcastle disease. A detailed study is presented on the comparative and differential pathology of the two diseases. The experimental material consisted of several thousand chickens and the Dutch East Indies strain and its variants of the fowl plague virus and four European and five North American strains of the virus of Newcastle disease.

The basic pathological lesion in fowl plague is focal necrosis in the viscera and central nervous system. In the embryonated egg, the fowl plague virus usually caused no lesions on the chorio-allantois, whereas the variants caused marked lesions here.

In Newcastle disease the basic pathology in the abdominal viscera was similar to that of fowl plague and proliferative changes occurred in the lungs and central nervous system. In the embryonated egg, the European strains caused chorio-allantoic lesions and the American strains caused primarily haemorrhages in the central nervous system.

The authors conclude that, taking into consideration the modifying influence of the host, the strain of the virus, the route of infection and the individual susceptibility, the comparative pathology of fowl plague and Newcastle disease establishes these diseases as separate entities.

II. The work described confirms the difficulties and irregularities encountered by others in the isolation of the virus of Newcastle disease in field cases. Early clinical cases or even preclinical cases, where the time of exposure can be estimated, are preferred for the recovery of the virus. The authors consider that though the concentration of the virus in the tissues may largely determine the passage of the infection to the embryonated egg, some degree of adaptation by the virus to the egg may be involved, especially where the virus content of the inoculation is low.

Exposure of a Newcastle disease—fowl plague virus mixture to pH4 for one hour destroyed the latter without apparently harming the former. Other avian viruses failed to agglutinate chicken erythrocytes and differences in haemagglutination between Newcastle disease and fowl plague viruses were noted, *e.g.*, fowl plague virus agglutinated the erythrocytes of the horse and cat, both of which were not agglutinated by Newcastle disease virus.

Other criteria employed included cross-neutralization of several virus strains by the respective immune sera and cross-immunity tests among vaccinated and recovered fowl.

III. The various methods of preparation of vaccines and the immunizing of chicks against Newcastle disease are reviewed and discussed.

Methods of inactivation, use of adjuvants and ansorbants, immunity response to vaccination, influence of the strain used, the influence of age and dosage, the route of administration, the time necessary for the development and the duration of the immunity are all investigated. A mass of data is presented which does not lend itself to abstracting. The addition of formalin provides a useful vaccine with high immunizing powers. The investigation into the antigenic structure of the different strains indicate that a polyvalent vaccine may be desirable. Chickens under four weeks of age from susceptible hens did not produce as high a resistance on vaccination as did older birds. Chicks from immune hens may not develop an active immunity if vaccinated during the first month. Serum antibody titres can be used to estimate the response to vaccination. Evidence of an immunizing response was found 2–4 days after vaccination and circulating antibodies were detected 6–8 days after vaccination.

The duration of immunity with formalin-inactivated vaccines varies greatly, in some cases it is as long as four months and in others it is only three weeks. A detailed study on the use of live weakly pathogenic strains of virus was not carried out, but from the substantial increase in serum titre following virus challenge in immune birds and from the little work so far carried out in the use of avirulent strains, the authors suggest that

vaccination with a killed virus followed in 1–2 weeks by live virus may prove the most practical procedure for field use.

IV. The results of experiments indicated that the antibody content of the yolk of eggs laid by immune hens was with few exceptions 10–100 times lower than the serum titre of the hens.

Demonstrable antibodies were found in the embryo tissues in such eggs early in incubation and in the serum the antibody activity increased from the 15th up to the 18th day of incubation to a level only slightly below that at hatching. Resistance to infection rose at the same time as the serum antibody content.

A high serum antibody titre was maintained during the first two weeks after hatching, followed by a rapid decline in titre as well as in immunity. This passive transfer of antibody was held to be responsible for the resistance to Newcastle disease virus of chickens hatched from immune hens and interfered materially with the active immunity response to vaccination.—D. Luke.

Moses, H. E., Brandly, C. A., & Jones, E. E. (1947.) **The pH stability of viruses of Newcastle disease and fowl plague.**—*Science.* **105.** 477–479. **1545**

Evaluations of the pH stability were made on four strains of Newcastle disease virus, including the English, 1933 Hertfordshire strain, and three " pneumo-encephalitis " strains isolated in California. Similar evaluations were made with a Dutch East Indies strain of fowl plague virus and a variant fowl plague virus. The viruses were exposed at pH 2–12 and were tested for infectivity after an hour, a day and a week.

Small variations occurred among the Newcastle disease virus strains. In the acid range, two of the California strains behaved similarly whilst one strain from this source was more resistant to acidity and was comparable to the Hertfordshire strain. All strains were similar in the presence of alkali after an hour's exposure: variations appeared with longer exposure.

After a week's exposure, maximum stability was present within the range pH 5–9, and there was survival within the range pH 2–11. These ranges were considerably broader than was demonstrable for fowl plague virus, which was more sensitive to an acid environment, having a maximum stability of pH 6–11. The stability pattens of fowl plague virus and its variant were essentially similar.—F. D. Asplin.

Komarov, A., & Goldsmit, L. (1946.) **Preliminary observation on the modification of a strain of Newcastle disease virus by intracerebral passage through ducklings.**—*Vet. J.* **102.** 212–218. **1546**

A Palestine strain of Newcastle disease virus was passaged intracerebrally 14 times in ducklings 4–8 weeks old. The ducklings were found to be highly susceptible to the virus by this route and sickened after an incubation period of 2–4 days. The virus was readily demonstrated in the brain, but not in the liver and spleen.

Six of seven fowls inoculated with fifth and sixth duck-passaged virus died of typical Newcastle disease, whilst all of 14 fowls inoculated with 10th–14th duck-passaged virus remained healthy.

All fowls which had remained healthy after inoculation with duck-passaged virus were challenged with fowl virus. Of five fowls challenged 12 days after inoculation with duck virus, one died and one sickened but recovered. All eight fowls challenged 18 days after duck virus inoculation remained healthy.

Intracerebral passage of Newcastle disease virus in pigeons failed to alter the virus qualitatively for fowls.—F. D. Asplin.

Bloch, H. (1942.) Die Beziehungen der Bakteriophagen zu den Virusarten. **[The relationship of bacteriophage to viruses.]**—*Schweiz. Z. Path. Bakt.* **5.** Suppl. pp. 64. **1547**

In an extensive review of the known facts about the physical and chemical nature of bacteriophages, their multiplication and their parasitism, B. endeavours to determine the relationship between bacteriophages and viruses. Much of the work to which reference is made is in English and readers of this language will find the list of 180 references of value.

Some of B.'s conclusions are that the data available about the physical and chemical nature of bacteriophages and viruses provide no evidence to justify their separation in any classification. In the host-parasite relationship one can observe some distinction in the complete parasitization of the host by the bacteriophage. Conclusions should not, however, be drawn solely from the results of *in vitro* experiments, with complete disappearance of the bacterial culture and cessation of the further possibility of multiplication of the bacteriophages. The greatest problem is still whether they are animate or inanimate. In B.'s opinion present knowledge is insufficient to provide the answer to this question.—W. M. Henderson.

Brion. (1946.) Les rickettsioses animales francaises. **[Rickettsial infections in animals in France.]**—*Rev. Path. comp.* **46.** 342–345. **1548**

The following animal infections due to rickettsia occur in France: conjunctivitis of sheep, conjunctivitis of cattle, rickettsiasis of dogs; whether the bodies found in psittacosis, *R.*

psitacci, are visible forms of a virus, B. considers undecided.

In birds infected with psittacosis the rickettsia are found in the endothelial cell, the mononuclear leucocytes, the brain and all parenchymatous organs. Some birds are symptomless carriers. A few small epizootics have been described in France, usually connected with a human infection.

Conjunctivitis of ruminants seems to be widely spread in France. It is a benign infection which heals without treatment, often leaving on the lids granulations which resemble those in human trachoma. The rickettsia are found in large numbers in the epithelial cells of the conjunctiva. Infection is by direct contact.

Rickettsiasis of dogs has been known only some years and little is known about its incidence in France; probably it is sometimes mistaken for leishmaniasis or piroplasmosis. Its main symptoms are high fever and haemorrhagic spots in the skin. The rickettsia are found in the monocytes of the blood, and at autopsy in liver and lungs. The infection is transmitted through the dog tick.

—A. Mayr-Harting.

Pilz, T. (1944.) La querato-conjunctivitis. **[Infectious keratitis.]**—*Rev. Med. vet., B. Aires.* **26.** 409–412. **1549**

P. reviews infectious keratitis in cattle which is very common in South America, especially in the River Plate countries. Stages in the disease are conjunctivitis, keratitis and blindness. The economic losses involved make the disease especially important in South America.

—H. G. Aramburu.

Baker, J. A. (1946.) **A rickettsial infection in Canadian voles.**—*J. exp. Med.* **84.** 37–50. [Author's summary copied *verbatim.*] **1550**

From apparently normal voles captured on Grosse Isle, Province of Quebec, Canada, an infective agent has been grown in embryonated eggs, and by inoculation an inapparent infection was established in voles, mice, guinea pigs, hamsters, and rats. No growth of the agent was obtained in the absence of living cells, and the manner of its development in the yolk sac of embryonated eggs, as well as morphological, epidemiological, and pathogenic features, indicates a rickettsial nature.

The inability to transmit infection by either cage or intrauterine contact points to a vector, and mites are shown to have a probable part in the epidemiology.

Mice infected with the vole agent resist lethal doses of the Karp strain of scrub typhus and certain epidemiological, morphological, and immunological features support the relationship indicated by the mouse tests. It is therefore concluded that voles on this island have an inapparent infection due to a rickettsia that may be related to the rickettsia of scrub typhus.

See also absts. **1568** (leucosis), **1572-1574** (fowl paralysis), **1575** (fowl sarcoma), **1589** (osteopetrosis in the fowl), **1594** ("X" disease of cattle in Saskatchewan), **1644** (fowl pox and penicillin), **1648** (anaesthesia and virus infections).

IMMUNITY

Weitzenberg, R. (1943.) Die Simultanimpfungen in der Veterinärmedizin. **[Simultaneous inoculation in veterinary medicine.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* August 20th. 279–281. **1551**

Simultaneous inoculation, in the wider sense of "double inoculation", is discussed under the headings of "sero-vaccination" (the use of an antigen before or after inoculation with antiserum), "simultaneous" (serum and antigen either injected at the same time, but in different positions, or mixed together and injected), and "sensitised causal agent."

The use of these methods in swine erysipelas, rinderpest, foot and mouth disease, swine plague, sheep pox, African horse sickness, distemper and anthrax is described, and it is pointed out that, except for swine erysipelas and anthrax, they have only a limited value as they involve the use of an active pathogen which may spread to neighbouring premises. It is claimed that this objection does not apply to swine erysipelas, as the pathogen is a widely distributed saprophyte; similarly, in the case of anthrax, the inoculated animal only excretes the pathogen for a week and its spread can be prevented by veterinary control. In rinderpest, virulent blood may introduce blood protozoa, or cause a flare up of latent infections, and loss results from abortions. In F. & M. disease a highly virulent virus is necessary, the spread of which is difficult to control, and the multiplicity of types complicates the balance of virus and serum. In swine fever, reacting animals are infectious for four weeks, and an error in diagnosis may be involved. The virus may be too weak to provoke immunity, or the serum too weak to protect. In African horse sickness, losses sometimes occur from inoculation, and other animals break down later, whilst in distemper it is difficult to obtain a reliable virus.—U. F. Richardson.

Sawyer, H. P., & Bourke, A. R. (1946.) **Anti-sheep amboceptor production with elimination of rabbit shock.**—*J. lab. clin. Med.* **31.** 714–716. **1552**

This modification of the methods of Vedder

(1919) and of HADJOPOULOS (1921) consists basically of laking sheep erythrocytes with amboceptor and complement, recovering and washing the stroma of the cells and using these as the injections for stimulating amboceptor production. The authors emphasize that they have not lost any rabbits through shock in the course of five years using this method, that satisfactory amboceptor is produced in ten days and that titres are high compared with those produced by whole erythrocytes.
—LIONEL M. MARKSON.

RAMON, G., RICHOU, R., MERCIER, P., & HOLSTEIN, G. (1946.) Dix années d'application de l'anatoxine staphylococcique a la thérapeutique des affections dues au staphylocoque en médecine humaine et en médecine véterinaire. Considérations genérales sur l'anatoxithérapie et la pénicillinothérapie. [**Staphylococcal anatoxins in medical and veterinary therapeutics.**]—*Rev. Immunol. Thérap. antimicrob.* **10.** 71–81. **1553**

The authors review the use of staphylococcus anatoxin in the treatment of staphylococcus infections during the previous ten years both in human and veterinary medicine. No serious reactions have followed the use of anatoxin. Of 2,948 human cases treated, 2,450 recovered and of 453 cases of various types of staphylococcus infection treated in animals, 349 recovered. Staphylococcus anatoxin has been combined with anatoxin prepared from Preisz-Nocard bacilli in the treatment of horses and sheep and other combinations also seem possible. The use of a mixture of staphylococcus anatoxin and penicillin is suggested to produce a more extensive and sustained action.
—S. J. GILBERT.

See also absts. **1490–1492** (swine erysipelas), **1510**, **1511** (tetanus), **1515** (malaria), **1524** (rabies), **1531** (equine encephalomyelitis), **1532** (virus abortion in mares), **1535** (louping-ill), **1536**, **1537** (swine fever), **1543**, **1544** (Newcastle disease), **1556**, **1557** (helminths), **1602** (nutrition and resistance to infection).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

FREIRE, J. J., & DUARTE, C. (1944.) Contribuição ao estudo da ordem Mallophaga. *Phagopterus columbae*, n. gen., n. sp., Parasito de Columba livia doméstica. [**Mallophaga: a new genus and species, *P. columbae*, from domestic pigeons.**]—*Bol. Soc. brasil. Med. vet.* **13.** 13–15. **1554**

The authors describe a new genus and species of Mallophaga, *Phagopterus columbae*, parasitic on the domestic pigeon in Brazil.

The parasite has a long narrow body. The triangular head is longer than it is broad. The anterior extremity of the antennal sinus has a cone-shaped prolongation. The five-jointed antennae are similar in both sexes. On the anterior border of the clypeus there are four claviform appendixes, two dorsal and two ventral. There are no eyes or ocelli. The legs are similar in the two sexes. The female measures 1·4 mm. in length and the male 1·2 mm. The colour is pale straw yellow, with dark marks at the borders of the abdominal segments.—MILLER WATSON.

BOUVIER, G. (1945.) De l'hémophagie de quelques mallophages des animaux domestiques. [**Haemophagia of certain Mallophaga of domestic animals.**]—*Schweiz. Arch. Tierheilk.* **87.** 429–434. [In French.] **1555**

By means of the Takayama reagent (which contains 5 ml. of a 10% solution of glucose, 10 ml. of a 10% solution of washing soda, 20 ml. of pyridine and 65 ml. of distilled water, and which gives an orange red colour to the preparation and characteristic crystals when the reaction is positive), blood was demonstrated in the gut of the following parasites:– *Dermanyssus gallinae*, *Ixodes ricinus*, *Ctenocephalus canus*, *Haematopinus suis* and *H. eurysternus*.

Negative results were obtained in *Menopon pallidum*, *Goniodes dissimilis*, *Lipeurus variabilis*, the g. pig biting louse *Gyropus ovalis*, and *G. gracilis* and a gamasid mite of g. pigs, *Leiognathus suffuscus*.

Blood was found in the gut of 50% of examined specimens of *Trimenopon jenningsi*, a specific parasite of g. pigs, and the intestine of *G. ovalis* contained a red-brown mass in the gut, although the Takayama test gave a negative result. *Trichodectes canis* gave a very slow reaction to the test. *Bovicola pilosa* and *B. bovis* gave a negative reaction. The mandibles of *B. ovis* and *B. caprae* are not adapted for blood-sucking.—B. A. T.

See also absts. **1521** (ticks), **1528** (chicken mites), **1649** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

LARSH, J. E., Jr. (1946.) **Immunity relations in human cestode infections.**—*Univ. N. Carolina Studies in Science.* pp. 201–210. Chapel Hill: University of North Carolina Press. [Author's summary copied *verbatim*.] **1556**

Brief consideration is given to certain general aspects of immunity included under natural resistance, age resistance, and acquired immunity. This is followed by a discussion of immunity to *Taenia cestodes*, *Echinococcus*, and *Hymenolepis*,

giving first a general account of the life cycle followed by selected papers which illustrate the immunity principles involved. It is pointed out that the adult or non-tissue stage of cestodes confers little or no immunity to reinfection, whereas parasitism with the larval or tissue stage elicits an active antibody response in the host which accounts, in large measure, for the ability to resist later infections. These studies with the recently accumulated evidence that immunological phenomena among these parasites are similar to, if not identical with, those of many other disease-producing organisms.

OLIVER-GONZÁLEZ, J. (1946.) **Functional antigens in helminths.**—*J. infect. Dis.* **78.** 232–237. **1557**

Previous work by the author has shown that protein-free polysaccharides isolated from several helminth parasites have the power to absorb the α and β isoagglutinins of human blood and the Forssman haemolysins in rabbit blood, when the polysaccharide is added to the serum [see *V. B.* **15.** 394 and **16.** 14].

CANNING (1929), working with *Ascaris lumbricoides*, demonstrated that each of the different tissues of this parasite, when injected parenterally into rabbits, gives rise to a specific antibody. The present author [*V. B.* **14.** 92] confirmed this work and further demonstrated that it was only anti-egg antibodies which were effective in causing precipitations and death of the larvae *in vitro*.

In this paper, the author combines these studies and describes further experiments, from which he shows that when rabbits are subjected to two separate infections with *Ascaris* eggs, the α_1 and α_2 isoagglutinin content of the serum is markedly raised, but the β, anti-O and cold agglutinin titres are unaltered. When rabbit sera containing α_1, α_2, β and cold agglutinins were mixed with suspensions of the various tissues of *Ascaris*, *i.e.*, sperm, ova, coelomic fluid, intestine, muscle and cuticle, α_1 and α_2 isoagglutinins were markedly reduced by the cuticle, while all tissues reduced the titre of the cold agglutinins to some extent. He found that when g. pigs, either artificially infected with *Ascaris* or passively immunized with serum from rabbits immunized by injections of whole worm suspensions, were given intravenous injections of various tissue fractions of the worm, those receiving coelomic fluid and those receiving saline extracts of intestine had symptoms suggestive of anaphylaxis, thus suggesting that the intestine and coelomic fluid give rise to anaphylactogens. [No control experiments were described to ensure that the effects were not caused by toxic substances in these tissues.]

These studies are of great interest in that they give further evidence to the growing concept that a multiplicity of antigens is concerned in metazoan immunity. Thus, with *Ascaris* infection, it has been shown that antibodies specific for each tissue of the worm are produced and that these antibodies differ not only in their specificity, as interpreted by cross-precipitation, but also in their physiological and immunological manifestations.—J. F. A. SPRENT.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

MATHESON, D. C. (1945.) **Observations on neoplasmata of the tegumentary system of the domesticated animals.**—*Indian vet. J.* **22.** 149–154. **1558**

Information is given as to the different tumours most likely to be encountered in connexion with the integument of horses, cattle and dogs, and the particular parts in which they occur. The article gives no new information.—P. R. K. I.

TUTT, J. B. (1946.) **Case of lymphadenosis in a thoroughbred stallion.**—*Vet. J.* **102.** 410–411. **1559**

T. describes a case of suspected lymphatic leucaemia in a stallion. There was bilateral enlargement of the lymph nodes of the carcass and viscera. The diagnosis was not confirmed. —A. R. JENNINGS.

GOLDFEDER, A. (1945.) **Relationship between morphology and X-ray effects in implants of mouse sarcoma 180 irradiated with 5,000 and 60,000 roentgens (in air).**—*Radiology.* **45.** 49–55. [Author's summary copied *verbatim.*] **1560**

After irradiation with 5,000 or 60,000 r. (in air), implants of mouse sarcoma 180 showed no increase in size during ten successive days. Extensive degenerative changes were observed in the tumor cells, including nuclear pyknosis and fragmentation and cytoplasmic vacuolization. Tumor giant cells with pronounced cytoplasmic changes were often conspicuous.

Cytological differences between the cells of implants irradiated with 5,000 r. and with 60,000 r. were not detected. During the last few days of observation the implants previously irradiated with 60,000 r. contained a smaller amount of tumor tissue than those irradiated with 5,000 r.

Evidence that active growth occurred in the

tumor implants irradiated with 5,000 r., which had previously been shown to induce resistance, was not observed.

STRONG, L. C. (1944.) **Mice-men-malignancy. Genetics proves its value as aid in cancer research.**—*Yale sci. Mag.* **19.** No. 3. 11–12, 26, 28 & 30. **1561**

S. states that the biological nature of cancer is the same in all species of animals. Emphasis is placed on the genetic approach to the problem and the relationship is expressed diagrammatically between homozygous and heterozygous strains of mice, together with their genetic constitutions and the types of tumour produced under various conditions. S. suggests that man be regarded as polyzygous (as in some strains of mice), as an aid to the understanding of the genetic aspect.
—A. R. JENNINGS.

DMOCHOWSKI, L. (1945.) **Comparative potency of the mammary tumour agent of mice of different genetic constitution.**—*Brit. J. exp. Path.* **26.** 267–269. **1562**

D. showed that the genetic constitution of mice which developed tumours differed from that of the strain which produced the tumour agent.
—A. R. JENNINGS.

GRAFF, S., RANDALL, H. T., CARPENTER, G. E., & HAAGENSEN, C. D. (1946.) **The milk factor in blood.**—*Science.* **104.** 289. **1563**

Whole blood and blood fractions from a strain of mice of high tumour incidence were shown to be very poor sources of the milk factor.—A. R. J.

COWDRY, E. V. (1945.) **Microscopic and chemical properties of precancerous lesions.**—*Science.* **102.** 165–168. **1564**

C. discusses the new states of chemical equilibria which are set up in precancerous epidermal cells following the application of carcinogens. [For details of the chemical factors involved see the original paper.] He goes on to indicate several lines of approach to the problems of when and where the malignant transformation takes place.—A. R. JENNINGS.

RUSCH, H. P., & KLINE, B. E. (1946.) **Further evidence for successive stages in the formation of neoplasms.**—*Arch. Path.* **42.** 445–454. **1565**

Methylcholanthrene dissolved in either benyzl alcohol or wool fat was applied at various periods to the skin of albino mice. Methylcholanthrene in wool fat did not produce visible neoplasms after a period of four months but the same area then treated with methylcholanthrene in benzyl alcohol quickly became neoplastic. Croton oil, a non-carcinogen, when substituted for the methylcholanthrene in this second stage of the process, had the same effect. The authors suggest that the second application merely stimulates the growth of existing tumour cells and conclude that the methylcholanthrene acts in two ways :– it is responsible for the genesis of the neoplastic cell and it then acts as a non-specific irritant to the tissues.

The authors divide tumour formation into a period of induction, a critical period and a period of progression.—A. R. JENNINGS.

FITE, G. L. (1945.) **Classification of tumors of the kidney.**—*Arch. Path.* **39.** 37–41. **1566**

F. studied 600 renal tumours and classified them into five main groups, with many subdivisions. All the tumours from the adult renal parenchyma were said to have a common basic papillary structure. Various transition stages from the purely papillary to the solid type were noted. These evolutionary stages were marked by (a) accumulations of glycogen and lipoids, (b) changes in the cytoplasm and (c) occlusion of the interpapillary spaces.—A. R. JENNINGS.

DURAN-REYNALS, F., SHRIGLEY, E. W., & DE HOSTOS, E. (1945.) **Carcinogenesis induced by methylcholanthrene in pigeons, guinea fowls, and ducks.**—*Cancer Res.* **5.** 11–17. [Authors' summary copied *verbatim.*] **1567**

It appears from the experiments that pigeons, guinea fowls, and possibly ducks may be added to the list of animals responding to the injection of methylcholanthrene with malignant tumors. The incidence in 21 pigeons was 47 per cent and in 12 guinea fowls 66 per cent, whereas only one tumor developed in 52 ducks and none in 10 turkeys injected.

The results show that there is no species relationship between the susceptibility of birds to the virus of the Rous sarcoma (1,2) and to methylcholanthrene.

Transplantation of 2 pigeon and 1 guinea fowl tumor through from 2 to 9 generations of birds of their respective species was accomplished, but attempts to transmit the pigeon tumors by means of Berkefeld N filtrates ended in failure. Filtration of the guinea fowl tumor was not done.

All the tumors induced were ordinary spindle cell sarcomas that frequently gave rise to metastases in the liver and, in the case of 2 pigeon tumors, in the bones of the lower extremities.

Benzol solutions of methylcholanthrene proved to be far more effective than lard solutions.

—. (1946.) **Discussion on leukaemia and leukosis in man and animals.** [Speakers :– ENGELBRETH-HOLM, J., BLAKEMORE, F., WHITE, E. G., ALSTON, J. M., LUDFORD, R. J., CAMERON, G. R., & FOULDS, L.]—*Proc. R. Soc. Med.* **39.** 735–740. **1568**

ENGELBRETH-HOLM dealt with the comparative pathology of leucosis. He was of the opinion

that the true leucoses were malignant tumours of the haemopoetic tissues. He pleaded for a better classification of the leucaemias and a clearer distinction between leucaemoid reactions following infections, myosclerosis and the true leucaemias.

BLAKEMORE discussed avian leucosis, with emphasis on fowl paralysis. He summarized the properties of the virus of neurolymphomatosis.

WHITE spoke of canine leucaemia. He described the clinical features of the conditions and stated that the incidence amongst 512 dogs examined P.M. was 1·8%. The other speakers discussed points arising from those raised by the previous speakers.—A. R. JENNINGS.

EGEHØJ, J. (1947.) **Some experimental investigations on the etiology of leucemia in cattle.** —*Amer. J. vet. Res.* **8.** 57–65. **1569**

Calves were given large amounts of skim milk intravenously and the resulting blood and tissue changes were noted. Other calves were given skim milk and streptococcal cultures intravenously and some received skim milk and spleen pulp extracts. Other experiments were carried out on calves which had been previously sensitized with skim milk: these calves were divided into three groups which were treated as follows:– Group I received intravenous inoculations of skim milk and subcutaneous injections of extracts of leucaemic lymph nodes. Group II received simultaneous intravenous inoculations of skim milk and serum from a cow affected with leucaemia. Group III received subcutaneous inoculations of and extract of leucaemic spleen pulp. In further experiments calves were inoculated with living tissue from leucaemic lymph nodes.

These efforts failed to produce leucaemia in calves and E. considers that it is unlikely that the cause of leucaemia is either a virus or chronic protein poisoning. He excludes soil and water as possible factors in the causation of the disease.

Details are given of blood examinations in herds in which leucaemia was present.—A. R. J.

INNES, J. R. M., PARRY, H. B., & BERGER, J. (1946.) **Leukaemia in dogs: including a record of a case treated by urethane.**—*Vet. J.* **102.** 383–393. **1570**

The authors survey briefly the literature on canine leucaemia. It is stated that observations on 30 cases (17 of which were autopsied) indicated that lymphadenosis in the dog closely resembled the disease in man. Doubt is raised as to the existence of a myeloid form. The gross and microscopic pathology of some of the cases is described.

Details are given of treatment with urethane of a case of acute lymphadenosis in a bitch and the effects of the drug are briefly discussed.—A. R. J.

HOGREFFE, G. (1946.) **Genotypical variation in the incidence and age distribution of spontaneous leukaemia in mice.**—*Acta path. microbiol. scand.* **22.** 615–621. [In English.] **1571**

H. confirmed work done by other investigators. He showed that the incidence of leucaemia in certain strains of mice was reduced and that the disease appeared later in life when heterozygous mice were produced as a result of cross breeding.—A. R. JENNINGS.

DAVIS, O. S., & DOYLE, L. P. (1947.) **Studies in avian leucosis. I. The transmissibility of visceral lymphomatosis. II. The use of biopsy technique in the study of visceral lymphomatosis.**—*Amer. J. vet. Res.* **8.** 103–112 & 113–119. **1572**

I. The authors claimed to have transmitted as a separate entity avian visceral lymphomatosis. The incidence of the disease was said to be increased by the use of a cell-containing inoculum. There did not appear to be any marked concentration of the infective agent in any particular organ. Females and capons were said to be more susceptible than males. The authors claimed that serial passage of the infective agent through chickens shortened the incubation period and increased the virulence. The percentage incidence of the lesions in the various organs was given.

II. The authors gave details of the technique of liver biopsy in fowls. They concluded that the method had little diagnostic value. A moderate amount of lymphoid infiltration of the liver of fowls was said to be normal.—A. R. J.

BURMESTER, B. R., PRICKETT, C. O., & BELDING, T. C. (1946.) **The occurrence of neural and visceral lymphomatosis in chickens proven immune to transplants of lymphoid tumor strains.**—*Poult. Sci.* **25.** 616–621. **1573**

Chickens which had survived inoculation with viable cells of transmissible lymphoid tumours [see OLSON, *V. B.* **14.** 16] were no more resistant to the occurrence of neural and visceral lymphomatosis than non-inoculated chicks of the same parentage. Inbred susceptible chicks of a line relatively free from lymphomatosis were immunized against cell transplants of lymphoid tumours. Visceral lymphomatosis occurred about four times, more frequently in such chicks than in non-immunized chicks of the same stock. The authors suggest that a filtrable agent may have been present in the immunizing tumour cell transplants. Plasma of fowls immunized against lymphoid tumours conferred passive immunity when injected into young chicks.—F. D. ASPLIN.

UBACH, F. A. (1944.) Parálisis infantil y parálisis aviar. **[Infantile paralysis and fowl paralysis.]** pp. 9. La Plata; Facultad de

Medicina Veterinaria. 8vo. **1574**

During 1933–44 there was an outbreak of infantile paralysis in the Argentine which caused considerable concern. Infantile paralysis was thought to be connected with fowl paralysis since the two diseases occurred concurrently.

U. discusses the nature of fowl paralysis and concludes that there is no evidence that it is related to infantile paralysis.—H. G. ARAMBURU.

DURAN-REYNALS, F. (1946.) **Transplantability and presence of virus in spontaneous sarcomas and fibromas of chickens in relation to the age of the tumor-bearing animal.**—*Cancer Research.* **6.** 529–534. [Author's summary and conclusions slightly amended.] **1575**

Fourteen spontaneous chicken sarcomas have been grouped according to the age of the chicken bearing the neoplasm. The presence of a causative virus, the transplantability of cells and other properties of the tumor have been studied.

Of the 4 sarcomas found in chickens of from 12 to 18 months of age, only one proved to be indefinitely transplantable and a causative virus could be demonstrated in its filtrates.

Of the 5 sarcomas found in chickens of from 23 days to 18 weeks of age, none was transplanted indefinitely although there are reasons to presume that 3 of them could have been so transplanted—one being carried through 2 passages—while 2 others were carried through 1 passage each.

Of the 5 sarcomas found in chickens of from 5 to 10 months of age, 4 proved to be indefinitely transplantable with causative viruses demonstrated in their cell-free preparations, and the same could be presumed in the fifth sarcoma.

Of the 7 fibromas which occurred in chickens of from 8 to 30 months of age, only one, in an 8–9 month chicken, could be carried through 2 passages.

Although indefinite transplantability and subsequent presence of free virus were traits of sarcomas histologically classed as malignant, another 7 sarcomas with the same or a higher degree of histological malignancy failed to show these features while the fibroma carried through 2 passages was histologically non-malignant.

In general a state of high malignancy in chickens was constantly associated with large, metastasizing sarcomas easily transplantable to chickens of several breeds and also to foreign species, namely, newborn ducks. These tumors were found most frequently in mature but not old chickens. Presumably, they may occur in some young chickens also. In all the indefinitely transplantable tumors, neoplastic viruses, their causative agents, were demonstrated.

See also abst. **1652** (neutralization of inhibition of growth).

DISEASES [NON-INFECTIVE] OF BREEDING STOCK

MILLEN, T. W. (1945.) **Training bulls for artificial insemination.**—*Indian Fmg.* **6.** 522–523. **1576**

The management of bulls used for artificial insemination work at the Agricultural Institute, Allahabad, is described.—M. P. JOHARI.

HERMAN, H. A., & RAGSDALE, A. C. (1946.) **Artificial insemination of dairy cattle.**—*Bull. Mo. agric. exp. Sta.* No. 494. pp. 32. **1577**

This popular manual is intended for farmers setting up co-operatives and for inseminators ("technicians") under training. An account of bovine genital anatomy and physiology is followed by instructions for collection of semen and insemination. Packing of semen for long distance transport is considered briefly, and there is a short note on the organization of co-operatives. The characteristics of bull semen receive the briefest mention.

The historical introduction states that in January, 1946, 250 co-operatives in the U.S.A. were serving about 300,000 cows. A special lubricant for the artificial vagina, comprising glycerin, water and gum tragacanth, is recommended as non-injurious to rubber. [But its poor keeping qualities, and doubtful effects on sperm, tell heavily against it, and the rubber wastage with the more usual lubricants appears much exaggerated.] It is claimed that some bulls will use a dry artificial vagina, but the difficulty of maintaining a bull's willingness to work is not stressed. The collection of semen by rectal massage has been successfully practised, with gratifying results in the cases of lame or half paralysed bulls of good breeding. A useful "chute" and crate for collecting in safety from a "mean" bull is described and illustrated. The method of examining and diluting semen is rather crude and no stress is laid on improved keeping quality following dilution; the short semen viabilities quoted suggest that this point has not been appreciated. Intra-cervical insemination has been practised as a routine, and the use of a trivalve or tubular speculum is advised. In a controlled experiment, natural service gave a slightly higher conception ratio than the artificial—both about 1·8 services per calf.

The authors confirm recently published British research, in recommending double insemination, during and again after heat, where the conception ratio is unsatisfactory. Semen is

regularly preserved, "shipped", and used on distant farms, by a packing technique involving no thermos bottle. This is effective to a maximum of 24 hours.

The organization section points out that surfaced roads and adequate telephone facilities are necessary for efficient operation. [The absence of veterinary control and the apparent absence of any form of state supervision are striking features.]

—F. L. M. DAWSON.

—. (1944.) Verordnung über die künstliche Besamung bei Haustieren. **[Switzerland: Regulation concerning artificial insemination in domestic animals.]**—*Schweiz. Arch. Tierheilk.* **86.** 308–309. **1578**

The semi-official Swiss Society for Animal Breeding decided in 1942 that artificial insemination had only a limited application under Swiss conditions of agriculture, that it was to be regarded only as a supplementary method to natural breeding, that it should be employed only for the better utilization of a few outstanding animals and that from the very beginning special legislation was necessary. In this last, particular consideration was to be given to the satisfactory marking of progeny.

In 1944, the performance of artificial insemination without a permit granted by a Government Department was forbidden. Detailed by-laws define conditions under which a permit may be granted. These are to prevent spread of infection, as, for example, during epidemics, for exceptional cases, when bulls are especially valuable and for research purposes.

Only well trained experts may be licensed to carry out artificial insemination, but recognized research institutes may sometimes be granted a general permit, provided they give regular accounts of their work.—C. AHARONI.

ANON. (1946.) **Artificial insemination of cattle in England and Wales.**—*J. Minist. Agric., Lond.* **53.** 364–368. **1579**

Progress since the last report in this periodical is reviewed. In June, 1946, 13 main centres were operating, with a total of 73 bulls and 4,832 members. The number of cows inseminated during the year then ending was about 35,000 and during the forthcoming year it was expected that the total would increase by another 10,000. Five centres were operated by the Milk Marketing Board, two by the Ministry of Agriculture, and the remainder individually by private firms or farmers' co-operatives. During 1946, it was expected that four more main centres would begin operations, and the Milk Marketing Board certainly intended establishing more in 1947.

Conditions attached to the grant of article 2 licences are detailed, and a paragraph deals with the need for further research work, especially on the extent to which semen can be diluted and on its viability *in vitro*. It is hoped that future results may make it possible to interchange semen between centres. A table of centres with their starting dates and the breeds of bulls kept is appended. Only at Kirton, Lincs., are beef bulls available.—F. L. M. DAWSON.

BARTON, M., & WIESNER, B. P. (1946.) **The receptivity of cervical mucus to spermatozoa.**—*Brit. med. J.* Oct. 26th. 606–610. **1580**

Semen and cervical mucus are practically immiscible. Fecundation depends on the ability of the sperms to penetrate the interface between mucus and semen. This process can be studied individually in special contact preparations, the receptivity of the mucus being assessed by exposure to fecund semen, while the semen itself is assayed against normal mucus obtained at the time of ovulation. In many sterile women the mucus does not admit or sustain spermatozoa. The authors claim that treatment with oestrogen is useful in such cases, and that sulphonamides are of value in cases where there is cervicitis of non-gonococcal origin.—J. M. ROBSON.

ROMANOFF, A. L., & HUTT, F. B. (1945.) **New data on the origin of double avian eggs.**—*Anat. Rec.* **91.** 143–154. **1581**

A series of ten double eggs, laid by a hen, each with a shell and containing a complete shelled egg, albumen, and a yolk is described in detail. The reasons for this abnormality and the possible mechanism of the formation of eggs of this type are discussed.—J. D. BLAXLAND.

PARKES, A. S. (1945.) **Preservation of human spermatozoa at low temperatures.**—*Brit. med. J.* Aug. 18th. 212–213. **1582**

An unspecified number of raw semen samples was frozen rapidly, by exposure for 1 min., to temperatures of –20°, –79°, –196°C. It was found that a large proportion of spermatozoa retained their motility when thawed quickly, in a waterbath at 37°C., so long as the container tube had a diameter of not less than 0·5 mm. The spermatozoa frozen in finer tubes, or "naked" on platinum loops, all died. In a further experiment survival was unaffected by eight days' freezing.

The rate of freezing or thawing is not itself, therefore, the primary factor in survival. P. appreciates that, although motility is retained after low temperature storage, genetic properties may nevertheless be adversely affected. As the sperm of all species of laboratory animals, including *Macacus rhesus*, is killed by exposure to this process, the question of genetic impairment, of fundamental importance in applying the storage

method for artificial insemination work, will be difficult to investigate.—F. L. M. DAWSON.

EICKMANN, H. (1944.) Untersuchung der Bullen auf Befruchtungsfähigkeit. **[Examination of bulls for fertility.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 52–53. **1583**

Of 8,000 young bulls examined for fertility before sale over a period of three years, less than 0·5% were infertile as judged by examination of semen samples. Inability to serve was found in 0·1% of the animals. Examination of semen collected in the artificial vagina is the only reliable method: other methods, such as collection of semen from the vagina of the cow of from the penis, massage of the ampulla of the vas deferens, or the use of a sheath, are unreliable and often lead to a fertile bull being condemned as infertile. Attention is directed to the methods described by GÖTZE (1938) for the examination of semen. The average sperm count is 0·7–0·8 million per cu.mm., and the amount of ejaculate is usually 4–5 ml. (lower limit possibly 2 ml.). Young bulls with normal semen should not be classed as infertile merely because the first few cows which they serve fail to conceive.—E. G. WHITE.

ZAVADOVSKY, B. M., & NESMEYANOVA-ZAVADOVSKAYA, E. G. (1945.) **Importance of vitamin content in fodder for the reproductive function and the content of pregnancy hormones in the blood of horses.**—*C. R. Acad. Sci. URSS.* **46.** 337–339. [In English.] **1584**

During the summer of 1942 it was found that among mares at a stud farm in the Omsk region there was a very low rate of fecundity and that the presence of gonad stimulators in the blood was protracted over a long period in mares which had become barren after resorption of the foetus. The modified chicken comb test was used for diagnosis of pregnancy and for presence in the blood of gonad stimulators.

Analysis of hay which had come from the Steppe zone of western Siberia showed a carotene content of only 2–4 mg. per kg. This, together with the absence of other leguminous fodder crops and roots led to the conclusion that the low fecundity and resorption of foetuses in such a high proportion of the mares was due to deficiency of vitamins.—R. ALLCROFT.

KOCH, W., & HAISCH, A. (1943.) Der Scheidenvorfall der Kühe, eine hormonal bedingte Konstitutionsschwäche. **[Prolapse of the vagina in cows due to hormonal deficiency.**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 131–132. **1585**

Chorionic gonadotropin (prolan) in oil, administered subcutaneously in doses of 250–1,000 r.u., proved of considerable value in the treatment of vaginal prolapse in pregnant and non-pregnant cows. It is considered probable that certain cases of vaginal prolapse are due to a deficiency of pituitary hormones. [See also FOLLEY & MALPRESS—*V. B.* **15.** 401, abst. 2421.]—ALFRED T. COWIE.

STEVENSON, W. G. (1945.) **Pregnant mares' urine as a source of oestrogens.**—*Canad. J. comp. Med.* **9.** 293–301. **1586**

S. discusses the collecting of pregnant mares' urine on a large scale for use in breeding operations. He refers to the conditions under which pregnant mares should be kept at such a centre. There is considerable variation in the concentration of conjugated oestrogens in mares' urine, but after the 100th day of pregnancy there is sufficient concentration to justify collection and extraction.

The pregnancy tests used were Kohler's and a slight modification of Cuboni's. The latter was found to be 90% accurate after the 120th day of pregnancy. An apparatus that automatically collects the urine and excludes the faeces was developed.—THOS. MOORE.

SCHWEIZER, R. (1945.) Ein Beitrag zur Sterilitätsbekämpfung. **[The control of sterility.]**—*Schweiz. Arch. Tierheilk.* **87.** 374–378. **1587**

Sterility which occurred in a herd of stall-fed cows in late winter was investigated. The herd bull was fertile, the general health of the cows was good and the diet appeared to be satisfactory. Clinical examination of the genital tract did not reveal any abnormality except that in a few cases the ovaries were somewhat smaller than usual.

A possible cause was thought to be a deficiency of vitamin E, resulting either in the ovulation of eggs incapable of fertilization or in interference with implantation.

Nineteen cows were given each day for 12 days one tablet of "vitamin E ephynal" containing 0·05 g. *dl*-α-tocopherol and were observed until after feeding with green fodder was resumed in the spring. Of the 19 cows treated, 16 conceived, 13 of them before feeding on green fodder had commenced and three after. [There were no controls.]—C. AHARONI.

BOGART, R., & MAYER, D. T. (1946.) **Environmental temperature and thyroid gland involvement in lowered fertility of rams.**—*Res. Bull. Mo agric. Exp. Sta.* No. 402. pp. 43. **1588**

Earlier workers having shown that "summer sterility" of rams associated with defective spermatogenesis could be reproduced in hot rooms during the winter and that, while thyroidectomy had an adverse effect on semen production, thyroxine administration improved it, even in summer. The present study aimed at determining whether the effect of temperature was produced

directly or through an endocrine organ; using goitrogenic substance thiouracil in place of thyroidectomy, thus eliminating interference from operation shock, etc.

Evaluation of semen quality, from samples collected weekly from each animal by an artificial vagina, was carried out with many precautions against error; seven criteria were used, including motility, percentage live and percentage abnormal sperm, total sperm per ejaculate, total volume and viability on storage.

In the first experiment three experimental rams received 1 mg. thyroxine daily by subcutaneous injection, during the "summer sterile" period and were compared with four normal controls. It was found that in the experimental group the decline in motility during the sterile season was unaffected, as compared with that of the controls, but the thyroxine had a dramatic effect in arresting the drop in total volume and total sperm per ejaculate, as well as maintaining the percentage live sperm and proportion of morphological abnormals at a level consistent with full fertility. Thus the result indicated that the rate of spermatogenesis was closely correlated with thyroxine intake, while motility and total semen volume connected with interstitial cell activity were not so correlated. When 1 g. of thyroprotein was fed daily, results were similar and almost as effective as when the pure hormone was injected. One ram was treated with thyroprotein at the height of the sterile period. The effect on the semen was quite marked, as in the first groups, and mating tests with the ram produced a good proportion of lambs.

Three rams were treated with thiouracil during the fertile breeding period in autumn, 2·5 g. in 25 ml. phosphate buffer being injected daily for seven weeks. The average semen values during the treatment period were similar to those for the naturally occurring summer sterile period. Orally, a dose four times greater was almost but not quite as effective. One ram received thyroprotein in stepped doses simultaneously with thiouracil. As had been expected, the sterility was counteracted, most spectacularly at a mean optimum dose level of thyroid-active substance.

The results are considered to justify a conclusion that the rate of spermatogenesis in the ram is controlled by the rate of hormone secretion in the thyroid gland. Thus summer sterility is in part due, not to the direct effect of the raised temperature on the testes, but to its depressant action on the basal metabolic rate, which produces a lowering of the thyroid output.

The features of summer sterility correlated with decline of interstitial cell activity, *viz*, poor sperm motility and reduced total semen volume, remain unexplained.—F. L. M. Dawson.

Coles, J. D. W. A., & Bronkhorst, J. J. (1946.) **The familial incidence of spontaneous** *Oesteopetrosis gallinarum.*—*Onderstepoort J. vet. Sci.* **21.** 79–98. **1589**

Thirty-nine cases of osteopetrosis were studied in the Onderstepoort experimental flock of White Leghorns. The disease showed a striking familial tendency and there was evidence that a susceptibility to the disease depended on a recessive character. The object of maintaining the flock was to breed a strain of fowls highly resistant to neoplastic conditions and it was noted that families in which cases of osteopetrosis had occurred seldom provided birds suitable in other respects for the breeding pens.

The literature dealing with osteopetrosis in fowls and man is reviewed at some length.

—J. D. Blaxland.

Berthelon & Tournut. (1946.) L'hémoglobinémie puerpérale chez les femelles domestiques. [**Puerperal haemoglobinaemia in female domestic animals.**]—*Rev. Méd. vét., Lyon et Toulouse.* **96.** 1–16. **1590**

This is a review without any original observations. The history, distribution, symptoms, evolution, pathological lesions, diagnosis, aetiology and treatment are discussed.—J. M. Robson.

See also absts. **1617-1619** (effects of high altitudes on fertility), **1692** (artificial insemination of cattle).

DISEASES, GENERAL

Gordon, W. S. (1946.) **Advances in veterinary research.**—*Vet. Rec.* **58.** 516–525. Discussion pp. 523–525. **1591**

In this paper given at the annual congress of the N.V.M.A. in London in 1946, Gordon describes the work done at the Moredun Institute on louping-ill, tick-borne fever and braxy and the condition in lambs known as tick-pyaemia. He describes in some detail the accidental discovery that scrapie could be transmitted by inoculation, which occurred when one batch of louping-ill vaccine was found to have been produced from scrapie-infected sheep: out of 112 sheep whose tissues had been included in the infected batch of vaccine, only eight were Cheviot lambs born from ewes which had been in contact with scrapie infection. Pigs inoculated with this vaccine were affected with scrapie at the rate of 1–35%, with an average infection of about 5%. Other diseases mentioned were those due to a deficiency of trace

elements, brucellosis in cattle, mastitis, swine fever and grass sickness in horses.

LAMONT, who opened the discussion, dealt with trichomiasis, its symptoms and diagnosis, and hoven and its treatment by subcutaneous injections of adrenalin, but the chief topic of his address was the tuberculin test. He gave the disturbing announcement that newly calved cows, although affected, frequently fail to react to the test and submitted figures from his experiments to the effect that up to 15·3% of errors to the test may occur. He then described the Stormont method of testing, which he asserted had only an error of 1·7% and no doubtful reactions. He also mentioned Aujeszky's disease, which is recorded in cattle, sheep, dogs, cats and pigs.

Amongst other speakers, TAYLOR dealt with antiparasiticides such as phenothiazine, D.D.T., "Gammexene" and sulphonamides, BLAKEMORE brought up the question of the great improvements in chemotherapy and DOBSON referred to poultry diseases, especially to Newcastle disease and fowl plague.—D. S. RABAGLIATI.

STÜNZI, H. (1945.) Die Bedeutung der pathologischen Histologie für die Diagnostik in der praktischen Veterinär-Medizin. [**The diagnostic value of histopathology in practical veterinary medicine.**]—*Schweiz. Arch. Tierheilk.* **87.** 399–403. **1592**

Although a rapid bacteriological test is valuable in the diagnosis of many infections, in a number of diseases the pathological histology alone can provide an answer. S. makes the following points :–

The specific granulation tissues of actinomycosis, botryomycosis, TB. and glanders are easily demonstrable under the microscope. Virus diseases can be differentiated into neurotropic, dermotropic and other groups, but full consideration of clinical anamnesis is often necessary. Certain microparasites such as *Sarcosporidia, Trichinella, Coccidia,* etc., need examination by microscope for their diagnosis. The differential diagnosis of avitaminoses and metabolic diseases is facilitated by microscopical examination, which can often distinguish their real nature when the clinical picture alone suggests a multitude of causes.

Histology is of value not only in estimating the quality and quantity of the tissues of an organ but also in finding the age of a tissue and the duration of the toxic influence. A leucocytic infiltration takes place a few hours after the appearance of the toxic agent; proliferation of fibroblasts follows in 2–4 days and 2–3 days later the collagenous fibres multiply. After 7–8 days, young capillaries enter the granulation tissue: elastic fibres usually appear only after 30 days. Biopsy on the living patient is important for the classification of all kinds of tumors; this surgical interference, however, sometimes causes metastatic activity.

Full utilization of the valuable contribution to diagnosis which pathological histologists can make can only be achieved in closest collaboration with the practitioner, who has all the clinical signs at his disposal.—C. AHARONI.

ECKELL, O. A. (1944.) Litiasis biliar en el caballo. [**Biliary calculi in a horse.**]—*Rev. Med. vet., B. Aires.* **26.** 322–329. **1593**

E. gives a review of biliary calculi in the horse, which he states are very uncommon. The findings P.M. in a horse which had had severe colic are described. In the liver, which weighed 6,200 kg., there were 71 calculi from 2 mm. to 4 cm. in diameter and countless minute calculi. The total weight of the calculi was 73·5 g. Chemical analysis demonstrated the presence of biliary pigments. According to E., the morphology of the calculi proves Rovsing's theory about their pathogenicity.—H. G. ARAMBURU.

CHILDS, T. (1946.) **X Disease of cattle—Saskatchewan.**—*Canad. J. comp. Med.* **10.** 316–319. [French summary.] **1594**

A disease of cattle noted in Saskatchewan in July and August, 1946, is described. The acute form in young cattle lasted 7–10 days, ending in death. Mature cattle had severe symptoms and, in several cases, died in 3–4 days. The cause was not determined. Points of interest noted included slowness of spread, that the epithelium of stratified squamous or cuboidal cells was attacked first, absence of pus formation, inflammatory exudates or adhesions on serous surfaces, cessation of digestive processes, dehydration of body tissues and excessive fluid in stomachs, distention of gall bladder, small blood volume and rapid clotting, and absence of fatty tissue. A subacute form was noted in which there was a history of illness for several months.—R. GWATKIN.

ARTHUR, G. H. (1946.) **The diagnostic value of the blood leucocyte picture in traumatic reticulitis and pericarditis of bovines.**—*Vet. Rec.* **58.** 365–366. **1595**

The blood leucocyte picture was studied in cattle in ten cases of reticulitis, five cases of pericarditis, and ten cases in which the clinical picture bore a resemblance to reticulitis (three of TB., two of Johne's disease, one of acetonaemia and three of actinobacillosis).

In the cases of reticulitis, there was no significant leucocytosis except in one case in which there were subsequently symptoms of pericarditis (leucocyte count varying between 7,300 and 12,000 per cu. mm.), but there was a neutrophilia, with

a shift to the left (unsegmented neutrophiles varying from 8–38% in the differential count) and an eosinopenia.

In the cases of traumatic pericarditis, there was a marked leucocytosis (17,850–31,000 per cu. mm.), a marked neutrophilia and shift to the left (unsegmented neutrophiles varying from 22% to 66% in the differential count). The eosinopenia was more severe than in the reticulitis cases.

There was no neutrophilic reaction in nine of the ten cases with similar symptoms to reticulitis that were due to other causes, and in the tenth case (clinical TB.) the lymphocyte percentage was higher than in the reticulitis cases.

It is concluded that a study of the blood leucocyte picture is of diagnostic and prognostic value in bovine traumatic reticulitis and pericarditis.—E. COTCHIN.

WEISCHER, F., & HOLLE, A. H. (1943.) Wesen und Ursachen der " Krampfigkeit " des Rindes (Multiple Sklerose ?). [**" Krampfigkeit " in cattle (? multiple sclerosis).**]—*Dtsch. tierärztl. Wschr.* **51.** 135–136. **1596**

The authors describe under the name " *Krampfigkeit* " an incurable disease of older cows characterized by stiffness of the hindquarters, and in advanced cases of the forequarters or even of the whole body. " Intention tremors " of the limb muscles accompany bodily efforts: after standing up, the hind limbs are for a time spread out or stretched out backwards and have muscle tremors. The condition may be first observed after transport. Affected cattle are usually in moderate or poor condition despite good feeding and treatment with vigantol or calcium is of no effect. The resemblances between the disease and disseminated sclerosis of man are noted and a study of the central nervous system in such cases is indicated.—E. COTCHIN.

WYSSMANN, E. (1944.) Zur Frage der Enteritis crouposa beim Rind. [**Enteritis crouposa in cattle.**]—*Schweiz. Arch. Tierheilk.* **86.** 473–483. **1597**

Croupous enteritis in cattle is an uncommon disease which is nearly always sporadic. It occurs at any time of the year in animals of either sex, but is almost unknown in calves. W. observed 15 cases in 30 years. The ascribed causes are many, including internal chilling, lack of proper food and consequent ingestion of unusual kinds of roughage, unskilful medication and so on. Occasionally paratyphoid infection causes croupous enteritis and such cases often end in death.

The symptoms are those of disorder of the alimentary tract and specific diagnosis is not possible until the end of the period of sickness, when intestinal casts are expelled. These are often massive and of considerable length, the greatest observed length being 16 metres. After this, recovery is usually rapid. Some case records and a summary of treatment are given. [One is inclined to think that some cases of croupous enteritis may be caused by the action on an irritated intestine of massive doses of some remedy such as linseed mucilage, etc.]—J. E.

KILCHSPERGER, G., & STÜNZI, H. (1946.) Zur Aetiologie und pathologischen Anatomie der Periarteriitis nodosa des Schweines. [**Aetiology and pathology of periarteritis nodosa in swine.**]—*Schweiz. Arch. Tierheilk.* **88.** 359–369. **1598**

The authors encountered lesions of periarteritis nodosa in 23 out of 1,068 carcasses or morbid specimens of pigs sent to them from east and central Switzerland. In all, the hearts were affected, in 21 the kidneys and in three the lungs, but in only one were lesions found in the skeletal muscles. The authors attribute the cause to a hypersensitivity of bacterial origin due to chronic swine erysipelas.—LIONEL M. MARKSON.

LESBOUYRIES, G., & GUILHON, J. (1942.) Parésie gastro-intestinale du lapin. [**Tympanites in lactating rabbits.**]—*Rec. Méd. vét.* **118.** 70–72. **1599**

The authors describe a gastro-intestinal paralysis which occurs very frequently in rabbits, especially lactating animals. The disease occurs very often a fortnight or three weeks after parturition; there are symptoms of inappetence, distension of abdomen, intestinal stasis and also, rarely, paralysis of the hind quarters. The condition usually responded to injections of calcium gluconate. Treatment recommended is the subcutaneous injection of 5 c.c. of a 10 or 20% solution of calcium gluconate, together with a hypodermic injection of 2 ml. camphorated oil, and 5–10 g. of castor oil *per os*.—J. S. S. INGLIS.

SCHLICHTER, J. G. (1946.) **Experimental medionecrosis of the aorta.**—*Arch. Path.* **42.** 182–192. **1600**

Medionecrosis of the ascending aorta was reproduced in dogs by coagulating the adventitia with a specially devised simple cautery. The pathological process was then studied by macroscopic observation in the living animal and P.M. by histological methods.—LIONEL M. MARKSON.

YUILE, C. L., GOLD, M. A., & HINDS, E. G. (1945.) **Hemoglobin precipitation in renal tubules. A study of its causes and effects.**—*J. exp. Med.* **82.** 361–374. **1601**

Transfusion reactions, blackwater fever, the crush syndrome and other conditions characterized by intravascular haemolysis present some features in common, including a fairly typical lesion found on P.M. examination, *viz*, epithelial degeneration

in the tubules of the renal cortex with pigmented casts in various parts of the tubular apparatus. This work was largely concerned with elucidating the factors responsible for the formation of these casts of haemoglobin or related pigments in laboratory animals with normal kidneys.

White rabbits 4–6 months old and 2·0–3·2 k. in weight were used. Half of these [total number not specified] were maintained on a diet producing alkaline urine, the other half on a diet producing acidic urine. Renal damage was produced by clamping the renal vessels or by subcutaneous injection of 20% aqueous sodium tartarate and haemoglobinaemia was produced by intravenous injection of calculated amounts of laked rabbit's blood. It was found that haemoglobin was precipitated in the tubules of damaged kidneys excreting acidic or alkaline urine, but that this did not occur in normal kidneys. Furthermore, when urine was acidic, haemoglobin casts were numerous and more persistent than when it was alkaline, and were associated with disturbances of renal function; there were no such disturbances when the urine was alkaline. The authors concluded that "the ultimate outcome, both anatomically and functionally, in any given instance is determined by variations in the degree of tubular damage, the level of haemoglobinaemia and the urinary pH."—LIONEL M. MARKSON.

NUTRITIONAL AND METABOLIC DISORDERS

ANON. (1946.) **Medicine, population, and food.** —*Lancet.* **251.** 349–350. **1602**

In the past, populations have been held in check by disease, famine and war, and to a lesser extent by contraception and infanticide. Of these factors, disease has probably been the most important. Pestilences have slain their millions, but of ever-present diseases such as pneumonia, gonorrhoea and malaria have been of even greater importance. There is evidence that the decline and fall of Greece and Rome were largely due to malaria, the sequence of events being deforestation by man and his goats, soil erosion, swampy valleys and the development of heavy mosquito populations. It is suggested that every year at least five million people are killed by various forms of malaria. Now, however, "paludrine," a true prophylactic, as well as an improved curative agent for malaria, is available, together with the sulphonamides and penicillin, as curative agents for pneumonia and gonorrhoea.

There remains in malnutrition one check to human life which can be even more deadly in the future. Even before the recent war 90% of people in the tropics were living on a diet, which might be adequate in calories, but was almost always deficient in proteins and vitamins of the B complex. With the increase of population, that will occur with the control of diseases, tremendous increases are essential in the production and transport of foodstuffs. It is suggested that working parties, each consisting of a doctor, an agriculturalist, a food technologist, a nutritionist and a welfare worker should visit not only the West Indies, as proposed, but every region of the world to report on prevailing conditions. More particularly the whole question of the synthesis of vitamins and essential amino-acids by laboratory methods on a manufacturing scale demands immediate attention.—U. F. RICHARDSON.

SCHNEIDER, H. A. (1946.) **Nutrition of the host and natural resistance to infection. II. The dietary effect as conditioned by the heterogeneity of the test pathogen population.**—*J. exp. Med.* **84.** 305–322. [Author's summary copied *verbatim.*] [For part I, see *V. B.* **16.** 135.] **1603**

The property of a diet of whole wheat and whole dried milk to promote a higher survival rate among a stock of heterogenetic, outbred W-Swiss mice subjected to *S. enteritidis* infection, over that promoted by a "synthetic" diet, has been shown to be a function of the infecting bacterial population.

Broth cultures so prepared as presumably to yield *S. enteritidis* organisms of uniform character have consistently failed to reveal an effect of diet on natural resistance, even though the parent bacterial populations revealed a dietary effect.

The dietary difference effect on natural resistance could not be demonstrated with an avirulent culture of *S. typhimurium*, or with a freshly prepared virulent culture of *S. typhimurium* presumably uniform in character.

The dietary effect on natural resistance was demonstrated by employing a 1:1 mixture of avirulent and virulent cultures of *S. typhimurium.*

ZELDIS, L. J., ALLING, E. L., MCCOORD, A. B., & KULKA, J. P. (1945.) **Plasma protein metabolism—electrophoretic studies. Chronic depletion of circulating proteins during low protein feeding.**—*J. exp. Med.* **82.** 157–179. **1604**

Long continued restriction of dietary protein in dogs was found by electrophoretic analysis to give decreased albumin levels, while the globulin level remained normal, or very slightly lowered. A higher figure was obtained for albumin by electrophoretic analysis than by chemical analysis.

Complete restoration of albumin in the depleted dogs took three or more weeks of feeding large quantities of protein, while globulin was promptly replaced. Plasma globulin, and certain tissue proteins, in contrast to plasma albumin, seemed to have priority demands on the total available body protein material under emergency conditions.

—JEAN P. BUXTON.

MADDEN, S. C., KATTUS, A. A., Jr., CARTER, J. R., MILLER, L. L., & WHIPPLE, G. H. (1945.) **Plasma protein production as influenced by parenteral protein digests, very high protein feeding, and red blood cell catabolism.**—*J. exp. Med.* **82.** 181–191. **1605**

With a substitute for plasma as the objective of the experiment, dogs which had been brought to a steady state of hypoprotein anemia by plasmapheresis, were used to test the suitability of certain protein digests for plasma protein production. Certain casein and serum digests given intravenously, subcutaneously, intraperitoneally or orally favoured good plasma protein production as well as nitrogen and weight equilibrium. A glucinin [protein from the soya bean] digest and variations of the casein and serum digests were not well utilized. Some evidence is given that the catabolism of red blood cells *in vivo* may aid in the production of plasma protein, the rate of which reached 1 g. per kg. per day when a very high protein diet of good quality was fed.

—JEAN P. BUXTON.

BEATTIE, J., & MARSHALL, J. (1944.) **Studies on hepatic dysfunction. II. The value of sulphur-containing amino-acids and casein digest in the prevention of post-arsphenamine jaundice.**—*Brit. med. J.* Nov. 18th. 651–655. [For part I, see *V. B.* **14.** 252.] **1606**

BEATTIE, J., HERBERT, P. H., WECHTEL, C., & STEELE, C. W. (1944.) **Studies on hepatic dysfunction. III. Carbon tetrachloride poisoning: sulphur metabolism.**—*Ibid.* Dec. 30th. pp. 847–849. **1607**

Following the observations of MILLER & WHIPPLE [see *V. B.* **13.** 180] that the administration of methionine to protein-depleted dogs prevented the liver damage resulting from chloroform anaethesia, the authors record an attempt to prevent post-arsphenamine jaundice in human beings undergoing syphilitic treatment. The results are summarized as follows :–

The incidence of the disease was not diminished by treatment with casein digest, casein digest reinforced with cystine, cystine, or methionine ; there was however marked alteration of the peak incidence of liver damage to later in the course of treatment and moderation of the severity of liver damage when it did occur. Of the four preparations methionine was the most effective. Cystine may act largely through rendering the arsenic non-toxic for the liver and presumably also for the spirochaete, whereas methionine is a liver " protector ", in the sense that it is a " deficiency factor " in a wartime diet too low in proteins to protect against a combined virus infection plus neoarsphenamine injections.

In a case of poisoning with carbon tetrachloride, a human being was successfully treated with methionine and casein digest given intravenously and it was found that the major part of the methionine sulphur was excreted in the neutral sulphur fraction. After six months' interval when liver function was normal, a second similar treatment of methionine was given and the excretion of neutral sulphur was found to be markedly different from that observed when the patient had carbon tetrachloride poisoning. The authors concluded that carbon tetrachloride interfered with the normal metabolism of methionine by the liver.

Of special veterinary interest are the comparisons of similar type hepatic syndromes occurring in animals, *e.g.*, blackhead in turkeys and its treatment with arsenicals and liver fluke disease in cattle and sheep and its treatment with carbon tetrachloride and felix mas, etc.—A. H. H.

BECK, A. B. (1941.) **Studies on the copper content of the milk of sheep and of cows.**—*Aust. J. exp. Biol. med. Sci.* **19.** 145–150. [Author's summary copied *verbatim.*] **1608**

An examination of the copper content of the milk of ewes and cows from normal and copper deficient areas of Western Australia has been made. It was found that :

The copper content of the milk of normal ewes fell progressively from values of 0·20 to 0·64 mg. copper per litre in early lactation to 0·04 to 0·16 mg. per litre several months later.

Similar falls were observed in the milk of some cows, but were not apparent in others. A considerable variation in the values was obtained, but the majority of the figures lay between 0·05 and 0·20 mg. copper per litre.

There was no correlation between blood copper levels and the milk copper variations.

Sheep and cows grazing on copper deficient pastures (1 to 3 p.p.m. copper dry basis) show reduced levels of copper in the milk. Values down to 0·01 to 0·02 mg. copper per litre were obtained in most cases.

OPIE, E. L., & LAVIN, G. I. (1946.) **Localization of ribonucleic acid in the cytoplasm of liver cells.**—*J. exp. Med.* **84.** 107–112. [Authors' summary copied *verbatim.*] **1609**

The attempt has been made to determine the

character of the basophile material that occurs normally in the cytoplasm of liver cells and accumulates in association with the hyperplasia of liver cells and of newly formed bile ducts when the azo dye butter yellow is administered to white rats. This substance in the normal liver cells, in the parenchymatous foci of basophile hyperplasia that are precursors of hepatomas, and in the hyperplastic basophile ducts that precede the cholangiomas produced by butter yellow has the characteristics of ribonucleic acid. It absorbs ultraviolet radiation of wave length 2536 Å. It does not, like desoxyribonucleic acid, give the Feulgen reaction. It is removed from the cytoplasm by ribonuclease, and precipitation with lanthanum acetate protects it against the enzyme.

BLAKELY, A. A. (1944.) **Clinical aspects of "grass staggers"—milk fever syndrome.**—*Vet. Rec.* **56.** 175–176. **1610**

B. discusses his experience in New Zealand of "grass staggers", of which he recognizes three types :– (1) Grass tetany, in which cows are found dead with few or no previous symptoms. There may be excessive excitability for a few days and usually there is violent struggling before death. They may be in good condition. (2) Complicated milk fever in which cows calved 1–5 days previously develop nervous irritability and milk fever with fair to no response to milk fever treatment. (3) Nervous acetonaemia, in cows calved more than five days previously. They may be down, but if standing there may be tendency to high-stepping gait. They are off milk and have staring eyes. There is a general increase in excitability.

Of 3,000 cases of metabolic disturbance there were 100 of simple milk fever, 90 of complicated milk fever, 180 of digestive acetonaemia, 50 of nervous acetonaemia, eight of milk fever type of acetonaemia and two of grass tetany.

Grass tetany occurs in late spring and is precipitated by spring grass. Treatment consists of subcutaneous injection of a solution containing 0·5 lb. magnesium salts in the early stages of the disease, or a dose of 0·5–8 oz. administered intravenously in the later stages. The disease is prevented by avoiding quickly growing grass and supplementing magnesium in the diet. Complicated milk fever and nervous acetonaemia occur mainly from July to September, where there is a falling-off in condition, caused by insufficient or unsuitable food, or a period of cold wet weather. Freshly grown grass is a precipitant. B. considers that low blood magnesium and acetonaemia occur in both, these being added to milk fever in the first case. Treatment of complicated milk fever is by the injection of calcium and magnesium, the action of these ions on the heart indicating the amount of each to be given. This is followed up with twice daily doses of carbohydrate, such as molasses or starch and Epsom salts. Treatment of nervous acetonaemia aims at the reduction of the nervous symptoms by the injection of magnesium (with calcium in reserve against cessation of the heart beat), followed by orthodox treatment of the acetonaemia. The prevention of types (2) and (3) is entirely dependent upon the provision of a suitable well-balanced diet.—R. SCARISBRICK.

I. DUTRA, F. R., & MCKIBBIN, J. M. (1945.) **The pathology of experimental choline deficiency in dogs.**—*J. Lab. clin. Med.* **30.** 301–306. **1611**

II. MCKIBBIN, J. M., FERRY, R. M., Jr., THAYER, S., PATTERSON, E. G., & STARE, J. F. (1945.) **Further studies on choline deficiency in dogs.**—*Ibid.* 422–428. **1612**

I. Weaned puppies were given diets, the protein content of which was low in methionine. Controls were kept on adequate diets and a number of the dogs on the methionine-deficient diet had supplements of choline or *dl*-methionine. Standard liver function tests were used and the results were correlated with the lipoid content of the liver. The puppies were killed immediately after the last series of liver function tests had been performed. P.M., the liver of the dogs on a diet deficient in choline was pale or pinkish yellow in colour and had fatty degeneration and fatty infiltration. The clotting power of the blood was lowered; in two puppies there was anaemia. In addition the thymus gland was under-developed. Since these lesions did not occur in the controls or in those dogs whose diets were either choline- or methionine-supplemented, they were considered to be manifestations of choline deficiency. No renal lesions were found in dogs, yet they were consistently found in rats on choline-deficient diets.—A. H. HOGG.

II. Since an excess of methionine protects puppies from choline deficiency and consequent liver damage, the role of the "labile methyl" group from methionine or choline was studied in the synthesis of creatine and creatinine and N-methylated derivatives of nicotinic acid. The control and choline-deficient dogs were rationed as previously [see *V. B.* **16.** 443]. In two choline-deficient dogs there was marked inhibition of growth and severe liver damage (as demonstrated by liver function tests) on the 53rd and 68th days respectively. The addition of 200 mg. % of choline chloride to the ration and a total of 6·65 g. given orally, by gelatin capsule during ten days, resulted in the restoration of normal liver function by the tenth day.

Choline supplementation of the diet did not significantly increase the excretion of creatine, etc., and the authors question whether this method may be of value for testing the methyl reserves of

dogs. In dogs with severe deficiency a week or ten days of choline supplementation produced normal liver function; in those with less severe deficiency five days were sufficient, but the authors stress that the condition was acute rather than chronic and that the choline dosage was high.
—A. H. Hogg.

Sampson, J., Morrill, C. C., & Alberts, J. O. (1945.) **Ketonemia in fetuses of a heifer and a ewe affected with severe ketosis.**—*Cornell Vet.* **35.** 365–369. **1613**

Analysis of unclotted heart blood from a heifer, which died as a result of severe ketosis, and from her two nearly mature foetuses revealed acetone values of 176·1, 104·9 and 81·0 mg. per 100 ml. blood respectively. Values obtained from a pregnant ewe in an advanced stage of ketosis and from her twin lambs were respectively 95·6, 20·6 and 20·3 mg. acetone per 100 ml. blood.

These observations are of interest since Snook & Godden [see *V. B.* **9.** 494] reported complete absence of ketone bodies in the blood of new born lambs from ewes with marked ketonaemia.—R. Allcroft.

See also abst. **1584** (vitamin A and reproduction).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Temperton, H., & Dudley, F. J. (1947.) **The reactions of baby chicks to chilling and overheating. Part I. Chilling and overheating in brooder units.**—*Harper Adams Util. Poult. J.* **31.** 42–51. **1614**

The authors review the literature on heat control and the influence of the thermal environment in young chicks.

Experiments are described in which groups of chicks were exposed to temperatures in excess of those likely to be met with under field conditions. Birds 36 hours old were exposed to temperatures of 103·7°–120°F. for periods of 12 hours. Controls were kept within 91·6°–96·3°F. Birds seven days old were exposed to temperatures of 115°–126°F. for periods of 12 hours. Controls were kept at 81°–91°F. In nearly every case the death rate was greater among the controls.

Groups of chicks 36 hours old were chilled to, in some cases, as low as 35·5°F. without any significant increase in mortality over control chicks. Chicks seven days old were chilled to temperatures as low as 47°F. In the group chilled to 47°F. nearly 58% deaths occurred, as compared with 11·1% in the control group. In another group chilled to 56°F. no deaths occurred.

Rectal temperatures were also studied. These rose substantially in the over-heated chicks confined to the brooder. There was a slight decline in the rectal temperature in young chicks with chilling.

P.M. findings on the chilled and over-heated chicks will be reported on separately.

[The results of these experiments are difficult to evaluate owing to the unduly high death rate among the controls, in some cases, 22%. No satisfactory explanation of this high death rate was found.]—D. L. Luke.

Menkin, V. (1946.) **The leukopenic factor of exudates. The mechanism concerned in the leukopenia induced by it.**—*Arch. Path.* **42.** 154–158. [Author's summary copied *verbatim.*] **1615**

The leukopenia following the intravascular injection of an acid exudate, of pyrexin or of the leukopenic factor is accompanied by a trapping of apparently all types of leukocytes in the alveolar walls of the lungs, in the sinusoids of the liver, in the splenic pulp and perhaps in the marrow.

This trapping of leukocytes offers a reasonable explanation for the mechanism of the leukopenia following the injection of the leukopenic factor.

The trapping of leucocytes in the pulp of the spleen may serve to explain in a reasonable way the primary mechanism of the acute splenic tumor accompanying numerous inflammatory processes.

Pyrexin, the leukopenic factor and necrosin seem to contain a common glycogen-inducing factor such that injection of any of these substances is followed by deposition of large quantities of glycogen in the hepatic cells and to some extent in the cardiac muscle fibers. This factor is being investigated further.

Watson, R. H., & Jarrett, I. G. (1912.) **Studies on deglutition in sheep: Observations on the response of the oesophageal groove mechanism to copper sulphate solution in sheep poor in condition from inanition.**—*Aust. vet. J.* **18.** 227–235. **1616**

There was no indication that response of the oesophageal groove mechanism to copper sulphate solution occurred any less readily when sheep were in poor condition as the result of a limited food supply than when they were in good condition.
—H. McL. Gordon.

I. *Monge, C. (1942.) **[Physiology of reproduction at high altitudes: applications to animal industry. The problem of fertility at high altitudes.]**—*An. Fac. Cienc. med.* [*Lima*]. **25.** 19–33. **1617**

II. *Monge, C., & San Martin, M. (1942.) **[Note on azoospermia in rams recently arrived**

at high altitude.]—*Ibid.* 58–62. **1618**
[Absts. in *Anim. Breed. Abstr.* **13.** 93 & 70, copied *verbatim.*].

I. A lecture stating the nature of the problem, its importance (animals newly arrived at high altitudes show 50–60% decrease in fertility), the various factors already known to be involved and some methods which promise to be useful in further studies.

II. Two Corriedale rams imported from Chile to 3200 m. altitude were studied. Both showed azoospermia at first. In one the process was apparently reversible; spermatozoa appeared later, and *p*H, sperm count, and motility approached optimal values. The other still showed azoospermia after 5 months, but at no time any decrease in sexual drive.

At 4000 m., the diluent of ram semen which gives maximum viability of sperm consists of NaK-tartrate 0·84 g., glucose (anhydrous) 5·4 g., and distilled water 100 cm.^{3}.

*Monge, C., & Chanez, P. M. (1942.) [**Physiology of reproduction at high altitudes: spermatogenesis at high altitudes.**]—*An. Fac. Cienc. med.* [*Lima*]. **25.** 34–40. [Abst. in *Anim. Breed. Abstr.* **13.** 114, copied *verbatim.*] **1619**

Histological study of the testes of 1 cat taken from sea level to 4500 m. altitude and kept there 6 months showed azoospermia. Not even spermatogonia were visible. [It is known that cats do not reproduce at high altitudes.] Similar study of 1 rabbit taken from sea level to 4000 m. altitude and kept there 15 days showed spermatogonia and primary spermatocytes, but no later stages. Rabbits [number not stated] similarly treated for one month or more showed entirely normal spermatogenesis histologically. A transitory inhibitory action of anoxaemia on spermatogenesis is suggested in explanation.

Huggett, A. St. G., & Pritchard, J. J. (1945.) **Experimental foetal death: the surviving placenta.**—*Proc. R. Soc. Med.* **38.** 261–266. **1620**

The injection of oestrone or pregnant mare's serum or bilateral ovariectomy in the rat all produce decidual necrosis leading to death of embryos, provided the procedure is performed before the 11th or 12th day of pregnancy. After the involution of the deciduoma and the establishment of the allantoic circulation these methods are ineffective in producing foetal death.

The placentae survive and grow normally and appear to be dependent solely on the maternal blood. The animals have the usual manifestations of normal pregnancy and this, in addition to other observations, indicates that the placentae continue to function as endocrine glands.—A. T. P.

POISONS AND POISONING

Dieke, S. H., & Richter, C. P. (1946.) **Comparative assays of rodenticides on wild Norway rats. I. Toxicity.**—*Publ. Hlth Rep., Wash.* **61.** 672–679. **1621**

Toxicity values for eight rodenticides were determined, using 406 recently trapped, adult, wild Norway rats (*Rattus norvegicus*). Prior to the administration of the poison the animals were held in stock cages for four or more days and after transference to individual cages were starved overnight. The various poisons, dissolved or suspended in 10% acacia solution, were given to the unanaesthetized rats by stomach tube (a device to enable handling without anaesthesia is illustrated). Values for the median lethal doses and their standard errors were estimated by the method of Litchfield & Fertig (1941). Results were as follows:–

Poison	*No. of rats*	*Weight of rats in grammes (average and range)*	*LD_{50} ± standard error (mg. per kg.) body weight*	*Survival time*
1,080 (sodium fluoroacetate) ...	55	342·2 (168–294)	0·22 ± 0·01	45–240 minutes
Strychnine sulphate	62	306·1 (142–493)	4·8 ± 0·4	12–90 ,,
ANTU (alphanaphthyl thiourea)	50	299·6 (142–482)	6·9 ± 0·5	16–30 hours
Thallium sulphate	37	297·6 (134–579)	15·8 ± 0·9	1·5–6 days
Zinc phosphide	35	249·9 (119–385)	40·5 ± 2·9	0·25–4 ,,
Arsenic trioxide	41	253·0 (148–493)	138 ± 13	0·25–3 ,,
Fortified red squill: Females...	34	244·2 (111–452)	133 ± 10	0·25–4 ,,
Males ...	33	296·2 (159–465)	276 ± 29	0·25–3 ,,
Barium carbonate	59	295·6 (143–468)	1,480 ± 340	1–8·5 ,,

—H. Paver.

See also absts. **1606** (arsenic), **1607** (carbon tetrachloride), **1654-1658** (BAL, British anti-lewisite).

PHARMACOLOGY AND THERAPEUTICS

BOTTOMLEY, A. C. (1946.) **Logistic dose-response curves: a theoretical approach.**—*J. Endocrinol.* **4.** 399–416. **1622**

EMMENS (1940) showed that a considerable variety of dose-response relations could be adequately represented by the logistic curve $y = \frac{L}{1 + e^{(\beta - x)/d}}$, where y = weight of test organ, x = dose, and L, α and β are constants. He also found that with a constant dose the time-response curve was logistic in some cases, *i.e.*, $y = \frac{L}{1 + e^{(\beta - t)/d}}$, where t = time. The present paper is an extension of this work. In it, the conditions are examined under which a logistic dose-response curve may be expected on theoretical grounds, and it is shown that this does not necessarily depend on a logistic time-response curve. Theoretical curves have been deduced for subcutaneous and intramuscular injections (both single and repeated doses), for intravenous injection (single dose and continuous injection at a uniform rate) and for dosage by tablet implantation.—J. M. ROBSON.

AMDUR, M. O., NORRIS, L. C., & HEUSER, G. F. (1946.) **The lipotropic action of manganese. [Correspondence.]**—*J. biol. Chem.* **164.** 783–784. **1623**

It was observed that manganese as well as choline prevents the deposition of excess fat in the liver. At a given level of choline, more fat was found in the livers of Mn-deficient rats than in the livers of rats receiving adequate Mn. The lipotropic action of Mn was much greater when the choline content of the diet was low, thus indicating an interaction between Mn and choline. It was also found that the presence of Mn in the diet caused a significant reduction in the percentage of fat occurring in the fresh bone; choline also significantly reduced bone fat.—R. ALLCROFT.

MERRITT, E. A., DEN, A. J., & WILCOX, U. V. (1944.) **The effects of radiation therapy in clostridium infection in sheep.**—*Radiology.* **43.** 325–329. **1624**

A minimum lethal dose of a strain of *Cl. welchii* was worked out on 12 uniform sheep for a special type of intramuscular injection involving surgical exposure of the muscle and some degree of injury.

In animals given radiation therapy (600–1,600 r. according to the individual case) the toxaemia appeared to be modified in that animals remained more alert. The most striking difference between the treated and untreated animals was the lack of evidence of spread of infection in the former.

The four sheep for whom the M.L.D. was not determined were from a different flock and proved more resistant to infection and affected the results statistically. In untreated animals mortality was 86%, or 75% including those from the second flock, and in treated animals mortality was 25%, or 29%.—S. M. G.

BISGARD, J. D., HUNT, H. B., & DICKINSON, R. H. (1944.) **Effect of X-ray irradiation upon bacterial toxaemia in rabbits.**—*Radiology.* **43.** 330–332. **1625**

In a previous (1942) study, the authors found that in rabbits X-ray treatment caused the production of non-specific antitoxin. Forty-eight hours after receiving 100 r. over the abdomen rabbits resisted intraperitoneal inoculations of diphtheria toxin and heat-killed culture of *Bact. coli*, both lethal to untreated controls.

In an experiment to see whether this response to irradiation was peculiar to the abdominal organs, 24 rabbits were each given 100 r., 12 on the chest and 12 on the extremities, and 48 hours later half of each group received 1 M.L.D. of diphtheria toxin and half 1 M.L.D. of *Bact. coli* toxin. Six untreated controls all died. All given the diphtheria-infected toxin and nine given the *Bact. coli*-infected rabbits survived. The authors conclude that antitoxin is produced irrespective of the organ irradiated and that if antibody production is the sole object of treatment, the irradiation of the infected tissue itself is unnecessary.

In a second experiment, groups of rabbits received varying amounts of irradiation and intraperitoneal injections as before. Results indicated that 20 r. was probably the minimum effective dose for rabbits; moreover, this amount appeared to be as productive of antitoxins as larger doses.

In a third experiment the effect of irradiating defibrinated blood and plasma was studied. After irradiation with 100 r. and incubation at body temperature for 48 hours, 1 M.L.D. *Bact. coli* toxin was added to batches of 14 ml., which were incubated at body temperatures for 48 hours and then injected intraperitoneally into rabbits. From the results in the inoculated rabbits it was found that antitoxin was not produced in response to the irradiation.—S. M. G.

DIERNHOFER, K. (1943.) Zur Anwendung von Sulfonamidpräparaten in der Tierheilkunde. **[Sulphonamides in veterinary practice].**—*Wien. tierärztl. Mschr.* **30.** [No. 5.] 97–100. **1626**

This is a short general review of the subject and contains no new knowledge.—C. AHARONI.

ANDRES, J. (1944.) Einige Versuche mit Cibazol ad us. vet. **[Experiments with cibazol veterin-**

ary.]—*Schweiz. Arch. Tierheilk.* **86.** 41–55. **1627**

This is an account of the treatment with cibazol [sulphathiazole] of a number of diseases in various species of domestic animal.

Forty-eight cases of retained placenta in the cow were treated by the insertion into the uterus of either an emulsion of the drug in liquid paraffin, or gelatin capsules containing 20 g. of cibazol, or ordinary commercially prepared tablets. All three forms of treatment gave good results, but the high cost of the drug made its use in practice expensive. Treatment was usually repeated every 2–3 days until the placenta was expelled. Treatment of five chronic bovine metritis cases which had previously received injections of iodine and vaccines produced cessation of the purulent discharge after 3–4 weeks, but the animals failed to conceive and the discharge recurred 6–8 weeks later. Cases of pneumonia in cattle, horses, pigs, sheep and dogs responded well to parenteral and oral dosage with cibazol. Early treatment with large doses was required. The course of the disease was reduced and secondary effects were avoided.

Nine horses treated for catarrh of the upper respiratory tract were fit for work within 8–10 days. Ten cases of cellulitis in the horse were treated with intravenous and oral doses and recovery was rapid: the horses could be put to light work within 6–10 days. Of 11 calves and two foals treated for bacterial infections by intramuscular and oral administration, six calves and one foal recovered completely. In two cases of bovine pyelonephritis treated for ten and 22 days respectively by oral dosage, there was no improvement, the urine still containing leucocytes, red cells, and diphtheroids.

A combination of intravenous and oral dosage had little effect in the treatment of chronic bovine mastitis. Of 16 cases treated, nine had apparent cure, but in five of them the disease recurred and in the remaining seven cows the milk continued to contain streptococci in spite of massive dosage. The bacteriological examination consisted of determination of the amount of sediment, and the approximate number of leucocytes and streptococci: there is no mention of isolation of the mastitis organisms. Those cases which were apparently cured continued to secrete milk which, although free from streptococci, contained large numbers of leucocytes and was deficient in quantity and poor in quality.—E. G. White.

Wood, W. B., Jr., & Irons, E. N. (1946.) **Studies on the mechanism of recovery in pneumococcal pneumonia. II. The effect of sulfonamide therapy upon the pulmonary lesion of experimental pneumonia.**—*J. exp. Med.* **84.** 365–376. [For part I, see *V. B.* **12.** 480.] **1628**

Wood, W. B., Jr., McLeod, C., & Irons, E. N. (1946.) **Studies on the mechanism of recovery in pneumococcal pneumonia. III. Factors influencing the phagocytosis of pneumococci in the lung during sulfonamide therapy.**—*Ibid.* 377–386. **1629**

Wood, W. B., Jr., Smith, M. R., & Watson, B. (1946.) **Studies on the mechanism of recovery in pneumococcal pneumonia. IV. The mechanism of phagocytosis in the absence of antibody.**—*Ibid.* 387–402. **1630**

[Authors' summaries copied *verbatim.*]

II. Experimental pneumococcal pneumonia was produced in albino rats by intrabronchial inoculation of Type I pneumococci suspended in mucin. The resulting pneumonia was uniformly fatal in untreated rats. Eighty per cent of the animals so infected and treated with sulfonamide drugs 6 hours after inoculation survived the pneumonia. At the end of 1 week the surviving animals were sacrificed, and examination of the lungs showed sharply demarcated localized pulmonary lesions containing no pneumococci.

Microscopic study of the lungs of treated animals sacrificed at 6, 18, 42, 66, 96, and 168 hours after the start of treatment revealed the following sequence of events. During the first 18 hours the drug apparently had little effect upon the pneumonic lesion, but at the end of 18 hours pneumococci in the edema zone began to show striking changes in their morphology, indicating bacteriostasis. Forty-two hours after the start of treatment the edema zone had disappeared, the pneumonia had ceased to spread, and the pneumococci at the margin of the lesion had been overtaken by leucocytes. Careful examination of the exudates in the periphery of the lesion revealed definite phagocytosis of pneumococci. By the 4th day no pneumococci could be found in the stained sections, and after 1 week there remained only macrophages in the rapidly clearing alveoli.

In order to demonstrate the phagocytic reaction more clearly the effect of sulfonamide drugs was studied in pneumonic rats previously rendered leucopenic by exposure to X-ray. The pneumonia in these animals was relatively acellular, and the few macrophages present in each alveolus could be seen to have phagocyted large numbers of pneumococci after 18 to 42 hours of treatment. The macrophages not only phagocyted the pneumococci but ultimately destroyed them, the pneumonic lesion later going on to complete resolution. The fact that this phagocytic reaction was observed in the lungs of animals with bacteremia suggests that the phagocytosis is inde-

pendent of circulating type-specific opsonins.

III. The phagocytosis which occurs in the lungs of rats receiving sulfonamide is due neither to an opsonizing action of the sulfonamides nor to type-specific antibody. The evidence presented indicates that the destruction of the pneumococci is brought about by a phagocytic mechanism independent of both opsonization and capsular injury.

IV. Evidence has been presented in previous publications that the phagocytosis of pneumococci in the pneumonic lung during chemotherapy is due neither to specific opsonins nor to capsular injury. The present studies have shown that the phagocytosis taking place in the lung is independent of any sort of intermediary factor and results from a direct action of the phagocytic cells upon the pneumococci.

Phagocytosis in the absence of antibody has been demonstrated not only in the lungs of living rats but in formalin-fixed lungs, on the surfaces of a variety of tissues (both freshly removed from the animal and previously "killed" with heat), and on the surfaces of such inert materials as moistened filter paper, cloth, and fiber glass. On the other hand, smooth materials such as glass, cellophane, albumin, and paraffin have failed to support the phagocytic reaction. This latter observation indicates that the physical character of the surface to which the leucocytes have access constitutes a determining factor in the non-antibody mechanism of phagocytosis.

Further experiments have defined the relationship of "surface phagocytosis" to that induced by specific opsonins. The non-antibody mechanism was found to operate only upon surfaces of suitable physical properties, whereas opsonins enabled phagocytes floating freely in a fluid medium to engulf the fully encapsulated organisms.

Direct visualization of the surface phenomenon in the lung revealed that leucocytes phagocyte the virulent organisms in the absence of antibody only after having trapped them against the alveolar walls. Once the encapsulated pneumococci have been ingested, they can be seen to undergo digestion within a few hours.

The discovery of the phenomenon of surface phagocytosis affords clarification of previously unanswered problems concerning the mechanism of recovery in pneumococcal pneumonia.

SESLER, C. L., & SCHMIDT, L. H. (1946.) **The effect of azochloramide on sulfonamide activity.** —*J. Pharmacol.* **86.** 344–354. **1631**

Azochloramide and sulphonamide have some slight synergistic action, but azochloramide does not reduce the resistance of sulphonamide resistant strains of pneumococci. The increased action with azochloramide is probably due to reduction in the numbers of organisms originally present. Azochloramide does not reduce the antisulphonamide action of peptone or *p*-aminobenzoic acid.—E. BOYLAND.

I. GALE, E. F. (1945.) **The arginine, ornithine and carbon dioxide requirements of streptococci (Lancefield group D) and their relation to arginine dihydrolase activity.**—*Brit. J. exp. Path.* **26.** 225–233. **1632**

II. GALE, E. F. (1945.) **The effect of sulphanilamide on the arginine and carbon dioxide requirements of streptococci (Lancefield group D).**—*Ibid.* 234–247. **1633**

I. Streptococci of Lancefield Group D, require arginine or ornithine and carbon dioxide. Higher concentrations of carbon dioxide are required if ornithine is the amino acid supplied. The amount of arginine required for optimal growth varies with the arginine dihydrolase activity of the organisms. The arginine dihydrolase activity is most active in young growing cultures.

II. Growth of the Group D streptococci in simplified media containing 0·1% sulphanilamide ceases when the arginine present has been used. Addition of further arginine results in renewed growth. Sulphanilamide is only antagonized by *p*-aminobenzoic acid when the pH is below 6·9 and it is suggested that a certain threshold concentration of carbon dioxide is necessary for the antagonistic action of *p*-aminobenzoic acid. This antagonism of carbon dioxide is only observed with sulphanilamide itself and not with other sulphonamides.—E. BOYLAND.

NITTI, F., & TABONE, J. (1942.) Etudes sur le pouvoir antisulfamide. I. Le comportement de l'acide *p*-aminobenzoique et des peptones vis-a-vis de quelques especes microbiennes. **[Studies on anti-sulphonamide action. I. Behaviour of *p*-aminobenzoic acid and peptones towards some bacteria.]**—*Ann. Inst. Pasteur.* **68.** 360–363. **1634**

TABONE, J., & NITTI, F. (1942.) Etudes sur le pouvoir antisulfamide. II. Quelques aspects chimiques du pouvoir antisulfamide des peptones (acétylation et dialyse). **[Studies on anti-sulphonamide action. II. Chemical aspects of the anti-sulphonamide action of peptones.]**—*Ibid.* 416–419. **1635**

I. Both peptone and *p*-aminobenzoic acid neutralize the bacteriostatic action of sulphonamide, but possibly by different mechanisms. High concentrations of *p*-aminobenzoic acid inhibit the growth of *Proteus vulgaris*, but this inhibition is neutralized by peptone. Peptone and *p*-aminobenzoic acid differ in their anti

sulphonamide activity with different organisms.

II. The antisulphonamide action of peptones is dependent on the presence of free amino groups, as the activity is destroyed by acetylation of the peptone.—E. BOYLAND.

ANON. (1946.) **Penicillin. Guidance for use in veterinary medicine.**—*Vet. Rec.* **58.** 327–328. **1636**

This note was prepared especially for the information of veterinary surgeons, as the note included in the packs of penicillin which are supplied to them was prepared primarily for doctors and dentists. The special properties of penicillin as regards stability, solubility, absorption, excretion and antibacterial action are mentioned, followed by directions for use and an account of methods of administration.

—E. COTCHIN.

BENEDICT, R. G., SCHMIDT, W. H., & COGHILL, R. D. (1946.) **The stability of penicillin in aqueous solution.**—*J. Bact.* **51.** 291–292. **1637**

Penicillin G is 50% destroyed in 18 min. at 24°C. and pH 2·0. Under the same conditions the half lives of penicillin X, F and K are 11, 11 and 7 min.—E. BOYLAND.

DOLL, E. R., & DIMOCK, W. W. (1946.) **Efficacy of various agents for delaying absorption of penicillin.**—*J. Amer. vet. med. Ass.* **108.** 310–313. **1638**

The use of vasoconstrictors, such as adrenalin or of glucose or gelatin in saline injections of penicillin caused no advantageous prolongation of effective blood levels. The use of such drugs was liable to lead to erratic absorption. Oil suspensions of penicillin are satisfactory and about twice as effective as saline solutions in maintaining blood concentrations in horses.—E. BOYLAND.

DOLL, E. R., & DIMOCK, W. W. (1946.) **Penicillin dosage and blood levels for horses.**—*J. Amer. vet. med. Ass.* **108.** 209–214. **1639**

Considerations of the blood levels of penicillin obtained on intramuscular injection and the sensitivity of the organisms indicate that the minimum dosage for strangles infections should be 300 units penicillin per lb. body weight every three hours. Other streptococcal infections require 500 units per lb. per hour, and staphylococcal infections even more. Infections with *Bact. equirulis* require at least 2,000 units per lb. per hour. Infections of *Corynebact. equi* are so resistant that penicillin therapy is unpractical.—E. BOYLAND.

MURNANE, D. (1946.) **Second report on the treatment of clinical streptococcal and staphylococcal infections of the bovine udder with penicillin.**—*Aust. vet. J.* **22.** 35–40. [For preliminary report, see *V. B.* **16.** 370.] **1640**

By varying the dose rates, the time intervals and the vehicles by which it was administered, calcium penicillin was found to be very efficient in the elimination of *Str. agalactiae* infections and relatively inefficient in the elimination of staphylococcal infections. The best results with *Str. agalactiae* were obtained by injecting 25,000 units in sterile peanut oil into affected quarters on three occasions at intervals of 24 hours.—D. C. BLOOD.

I. MURPHY, R. (1946.) **The treatment of mastitis.**—*Vet. Rec.* **58.** 277–279. **1641**

II. MOON, G. J. H. (1946.) **Penicillin in the treatment of mastitis.**—*Ibid.* 326. **1642**

III. EDWARDS, S. J., & BROWNLEE, A. (1946.) **Therapeutic treatment of bovine mastitis.**—*Ibid.* 335–343. **1643**

I. M. treated mastitis (chiefly streptococcal and staphylococcal of a chronic type) in about 300 cows in several herds. Drugs used were :– L.S.F. a lactose-sulphanilamide-formalin preparation ; hypholin ; staphylococcal toxoid ; sulphanilamide—orally, or in suspension in liquid paraffin for intramammary infusion ; and sodium penicillin. M. concludes that : " Penicillin treatment is the best and most economical in streptococcal cases and in mixed streptococcal and staphylococcal cases, and staphylococcal toxoid is most economical in pure staphylococcal cases, especially if more than one quarter is affected. The failures from staphylococcal toxoid treatment should be given penicillin treatment."

II. Tablets (10,000 units) of the calcium salt of penicillin were dissolved in sterile distilled water or boiled tap water and udder infusions were made using a 50 ml. Record syringe with 1½-in. siphons. In cases of clinical streptococcal mastitis, infusions of 10,000–30,000 units in 50–100 ml. of water were given, repeated in 24–48 hours, with a third or fourth infusion if required. In a large number of clinical cases, cures were observed after two infusions, some long-standing cases being resistant. In dry cows, the majority of cases gave apparently normal secretions following a single infusion of 30,000 units in 100 ml. of water which was not stripped out. Severe and chronic cases in dry cows were given three infusions at 48-hour intervals and induration frequently disappeared. The majority of cases of staphylococcal mastitis treated in the early stages of an attack responded to treatment.

III. The results are given of the experimental use of three substances—sulphanilamide, tyrothricin, and penicillin—in the treatment of 64 clinical cases of bovine mastitis, involving 154 quarters, by intramammary injection. The infecting organism was determined in each case : *Str. agalactiae* in 86% of quarters (27 of the cows came from two herds where clinical mastitis was almost entirely due to this organism), *Str. dysgalactiae* in

2%, *C. pyogenes* in 6%, staphylococci in 5%, and *Bact. coli* in 0·6%. Infected quarters were treated according to one or other of three programmes :–

GROUP 1. *Primary treatment with sulphanilamide.* 1st course : 4 daily injections of 50 ml. of a 30% oil-in-water emulsion of the consistency of creamy milk. 2nd course : 4 further daily injections. 3rd course : 2 daily injections of tyrothricin. 4th course : 2 further daily injections. 5th course : 2 daily injections of penicillin cream or solution. 6th course : 2 further daily injections.

GROUP 2. *Primary treatment with tyrothricin.* 1st course : 2 daily injections of 150 mg. in 25 ml. distilled water. 2nd course : 2 further daily injections. 3rd course : 4 daily injections of sulphanilamide emulsion. 4th course : 4 further daily injections. 5th course : 2 daily injections of penicillin cream or solution. 6th course : 2 further daily injections.

GROUP 3. *Primary treatment with penicillin.* 1st course : 2 daily injections of 10,000 units. 2nd course : 2 further daily injections. 3rd course : 4 daily injections of sulphanilamide emulsion. 4th course : 4 further daily injections.

The success or failure of any given course was assessed by its action on the causal organism and on the secretion as shown by the results of daily tests during the treatment and of three consecutive daily tests taken immediately after the course. If a quarter failed to respond to the first course, it was placed at once under the next course, and so on. The object of adopting this continuous method of applying the three therapeutic substances under trial was to make a comparison of their relative efficiency when tested on the same infected quarter. The criterion for the success of any given treatment was the absence of the causal organism from the milk at the three daily tests taken after the last injection and at eight tests taken at weekly intervals thereafter.

The results obtained in the case of *Str. agalactiae* mastitis were as follows :–

(1) Of 105 quarters of 41 cows, treated primarily with sulphanilamide, 78 responded to the first course and a further 12 to the second course (a total of 86%). The success or failure of sulphanilamide therapy did not appear to be related to the *in vitro* sensitivity of the infecting strain. It was found that strains sensitive *in vitro* belonged in the main to serological groups 1a and 3a, insensitive strains belonging to groups 1b and 3b. Of the 15 quarters not responding to sulphanilamide, six responded to tyrothricin and seven to a further penicillin course, while two quarters only resisted all three forms of treatment.

(2) Of 18 quarters of six cows treated by two daily injections of tyrothricin, 14 (78%) recovered. Two quarters which resisted two courses of tyrothricin treatment responded to a single course of sulphanilamide, while the remaining two quarters of a single cow resisted all forms of treatment.

(3) Of 12 infected quarters of six cows treated with penicillin, seven (two being infected with *Str. dysgalactiae*) responded to two daily injections of 10,000 units, while five required one further course of sulphanilamide.

The results obtained in the treatment of infection due to organisms other than streptococci were on the whole disappointing with all three substances. Five quarters infected with staphylococci were not influenced by sulphanilamide, nor were two quarters affected with *Corynebact. pyogenes.* Tyrothricin had no beneficial effect on seven quarters affected with *Corynebact. pyogenes* or one with staphylococci. Penicillin also proved of no value in the treatment of mastitis due to *Corynebact. pyogenes* in spite of continuous treatment. There was evidence, however, that penicillin was more likely to be successful in the treatment of staphylococcal mastitis than the other two substances, provided adequate dosage was administered.—E. COTCHIN.

ROBBINS, B. H. (1944.) **Effect of penicillin and patulin on fowl pox.**—*Proc. Soc. exp. Biol., N.Y.* **57.** 215–216. **1644**

Neither penicillin nor patulin had any inhibitory effect on the growth of fowl pox virus on the chorio-allantoic membrane of duck embryos.—E. BOYLAND.

RAKE, G., & DONOVICK, R. (1946.) **Studies on the nutritional requirements of *Streptomyces griseus* for the formation of streptomycin.**—*J. Bact.* **52.** 223–226. [Authors' summary copied *verbatim.*] **1645**

The volume of medium in shake-flask cultures of *Streptomyces griseus* plays an important role in the concentration of streptomycin obtained in the broth.

Beef extract is not required for streptomycin production in a medium containing soybean meal, glucose, and sodium chloride. In fact, the addition of beef extract to such a medium in shake flasks delays somewhat the production of this antibiotic.

It is necessary to add an inorganic salt, e.g., sodium chloride, to soybean meal media for streptomycin production.

Preliminary studies indicate that sodium sulfate may be substituted for sodium chloride, but the substitution of magnesium chloride for either of these two electrolytes gives lower streptomycin yields.

Beef extract may supply a certain amount of the salt required in a soybean meal medium.

SANTIVANEZ, J. (1946.) **The antibacterial action of streptomycin.**—*Cornell Vet.* **36.** 214–221. **1646**

Streptomycin inhibits the growth *in vitro* of *Br. abortus* and *Past. avicida* in low concentrations. Higher concentrations are required for antibiotic activity against *S. typhi-murium*, *S. pullorum* and *S. bredeney*.—E. BOYLAND.

CARLSON, H. J., BISSELL, H. D., & MUELLER, M. G. (1946.) **Antimalarial and antibacterial substances separated from higher plants.**—*J. Bact.* **52.** 155–168. [Authors' summary slightly amended.] **1647**

The saline extracts of five plants (buttercup, sagebrush, dwarf waterleaf, mountain pasque, and juniper) out of more than 200 tested were found to have antibacterial and antimalarial activity by *in vitro* methods.

One plant, buttercup, was found to inhibit the growth of many gram-negative and gram-positive bacteria, fungi, soil organisms, and non-pathogenic protozoa by *in vitro* methods.

Mountain pasque [anemone] and buttercup were found to contain vapors which were bacteriostatic and bactericidal. Volatile oils separated from the same plants were found to exhibit similar activities.

An extract of mountain pasque was found to protect mice heavily infected with the pneumococcus.

Two plants, sagebrush [wormwood] and dwarf waterleaf, contained substances that protected chickens during the blood phase of malaria.

An incidental observation revealed that the same two plants possessed anesthetic properties in chickens and mice.

SULKIN, S. E., ZARAFONETIS, C., & GOTH, A. (1946.) **Influence of anesthesia on experimental neurotropic virus infections. I. In vivo studies with the viruses of western and eastern equine encephalomyelitis, St. Louis encephalitis, poliomyelitis (Lansing), and rabies.**—*J. exp. Med.* **84.** 277–292. [Part of authors' summary copied *verbatim*.] **1648**

Anesthesia with diethyl ether significantly alters the course and outcome of experimental infections with the equine encephalomyelitis virus (Eastern or Western type) or with the St. Louis encephalitis virus. No comparable effect is observed in experimental infections produced with rabies or poliomyelitis (Lansing) viruses.

The neurotropic virus infections altered by ether anesthesia are those caused by viruses which are destroyed *in vitro* by this anesthetic, and those infections not affected by ether anesthesia are caused by viruses which apparently are not destroyed by ether *in vitro*. Another striking difference between these two groups of viruses is their pathogenesis in the animal host; those which are inhibited *in vivo* by ether anesthesia tend to infect cells of the cortex, basal ganglia, and only occasionally the cervical region of the cord. On the other hand, those which are not inhibited *in vivo* by ether anesthesia tend to involve cells of the lower central nervous system and in the case of rabies, peripheral nerves. This difference is of considerable importance in view of the fact that anesthetics affect cells of the lower central nervous system only in very high concentrations.

BUXTORF, A. (1945.) Neue Insektizide in der Veterinärmedizin. **[New insecticides in veterinary medicine.]**—*Schweiz. Arch. Tierheilk.* **87.** 511–523. **1649**

This paper includes two useful tables listing the arthropod parasites of animals of veterinary importance, the damage they cause, and the insecticides which can be used against them. The first table deals with insecticides used before the discovery of D.D.T. and the second gives the relative effects of this compound.—B. A. T.

SCHWEIZER, R. (1946.) Behandlung des Straubfusses des Pferdes mit Sterosan-Puder. **[Treatment of "grease" with sterosan powder (Geigy).]**—*Schweiz. Arch. Tierheilk.* **88.** 102–106. **1650**

Two early cases and three chronic cases of "grease" in the horse were treated with "sterosan-powder", a dichloroxyquinoline preparation, which was applied daily at first and then every 2–3 days. Twice a week the feet were washed in warm 3% creolin solution and all powder and secretion removed. One of the early cases was completely cured after six weeks and the other had considerably improved at the end of two months. The three chronic cases, which had been treated with a variety of medicaments for periods of 3–10 years, had marked improvement after 2–3 months. Further trials are needed to see whether early cases, which have apparently been cured, recur and also to what extent long-standing cases are cured.—E. G. WHITE.

KALTENEGGER, A. (1944.) Ueber die Bekämpfung der Fohlenlähme. **[Control of joint-ill in foals.]**—*Berl. Munch. tierärztl. Wschr./Wien. tierärztl. Mschr.* April 28th. 136–138. **1651**

Two types of joint-ill are recognized. In the first, a sudden rise in temperature, complete anorexia and painful swelling of one or more joints, with surrounding oedema, occur 1–6 days after an apparently normal birth. Pulse and respiration rates are accelerated and death follows quickly. P.M. examination may reveal purulent swellings in joints or even the whole foot. In

the second type, the swelling affects at first only one joint and may occur from the second to eighth week, although it is most common in the second to third week. The sero-fibrinous arthritis is not usually accompanied by surrounding oedema, although the joint is 2–3 times its normal size. Elevated temperature precedes the arthritis and animals continue to eat for a time, but die after a few weeks. Streptococci have been isolated from this type of infection.

Treatment is said to be usually unsuccessful, but it is stated that injection of iodine into affected joints, coupled with previous removal of excess fluid yielded success.—C. Aharoni.

Keresztesy, J. C., Laszlo, D., & Leuchtenberger, C. (1946.) **Neutralization of inhibition of tumor growth.**—*Cancer Res.* **6.** 128–130. **1652**

The inhibition of growth of the sarcoma 180 in mice by inositol can be neutralized by *p*-aminobenzoic acid, pyridoxine but only slightly if at all by thiamine, nicotinamide *o*-aminobenzoic acid, *m*-aminobenzoic acid or leucopterin. Inhibition by desthiobiotin could be neutralized by *d* biotin.—E. Boyland.

Pavlovskiĭ, M. A. (1940.) Opyty primeneniya simpatomimetina prof. Chukicheva. [**The use of Chukichev's sympathomimetine in veterinary practice.**]—*Veterinariya, Moscow.* No. 4. pp. 139–144. [French summary.] **1653**

P. gives a short survey of protein therapy, which was started in Russia in 1905 by Toushnoff who pointed out that the end-products of metabolism of albuminous substances (which were called inter-excretions) were not only waste products, to be either neutralized or eliminated by the body, but that these " end-products " could exert a regulating effect on some parts of the body and produce non-specific healing properties.

Chukichev (1933) arrived at the same conclusions, *i.e.*, that the end-product of breakdown of some albuminous substances, particularly fibrin, produced a neutral lysin, forming a useful agent for non-specific protein therapy. This substance was named " sympathomimetine " (or fibrolysin) and was used in doses of 10^{-8} or higher. This agent, which the authors presume to act through the sympathetic nervous system, has been used both in human and veterinary medicine. In human beings it has been mainly administered *per os*, in diseases of the heart, blood vessels, lungs, gastro-intestinal tract, uterus and ovaries. In its veterinary application sympathomimetine has been administered either *per os* after fasting or by injections in the following conditions :– endometritis, retention of foetal membranes, catarrh of the gastro-intestinal tract, colic, extensive inflammation, *e.g.*, abscesses, haemotomas, contusions, etc., reduced lactation, inappetence of undiagnosed origin, avitaminosis and rickets, conjunctivitis (externally in dil. 1 : 1,000) and anaemia.

P. injected this agent subcutaneously in small animals and intravenously in large dogs, pigs, goats, cows and horses. The usual course given was of 2–4 injections with 2–3 days' interval, in most cases with good results. It has also been used to remove fatigue in over-tired heavily worked horses. Eleven cases were selected, and the usual symptoms of fatigue began to disappear after the first treatment, and completely cleared up after the second or third treatment. It has also been tried in eczema in the dog, and osteomyelitis in goats, useful results being reported.

Ordinary treatment, sanitation, diet and draining and dressing of septic cavities must accompany the use of this agent. As sympathomimetine is non-specific, P. points out that specific treatments must still be employed in preference.
—O. Uvarov.

I. Peters, R. A., Stocken, L. A., & Thompson, R. H. S. (1945.) **British anti-lewisite (BAL).**—*Nature, Lond.* **156.** 616–619. **1654**

II. Waters, L. L., & Stock, C. (1945.) **BAL (British anti-lewisite).**—*Science.* **102.** 601–606. **1655**

III. Anon. (1946.) **The substance called " BAL ".**—*Brit. med. J.* Feb. 16th. 240–241. **1656**

IV. Danielli, J. F., Danielli, M., Mitchell, P. D., Owen, L. N., & Shaw, G. (1946.) **Development of a chemotherapy for systemic arsenical poisoning.**—*Nature, Lond.* **157.** 217–218. **1657**

V. Anon. (1946.) **American work on BAL.**—*Ibid.* 218. **1658**

I. A brief review is given of the observations leading to the development of BAL (British anti-lewisite) its chemistry, mode of action and medical applications. BAL forms stable arsenical compounds which are rapidly eliminated from the body; inunction and intramuscular treatments have been used successfully in cases of arsenical dermatitis and encephalitis. American workers used 10% benzoyl benzoate in arachis oil as the vehicle for intramuscular injection of BAL. Hepatic damage is a contra-indication to BAL treatment. Formation of stable compounds of BAL with other metals is being investigated for treatment of other metallic poisoning.

II. A brief review of an American study of BAL is summarized under the following headings:– preparation and chemistry, biochemical action, toxicology and pharmacology, experimental therapeutics and medical application. BAL was found

to be toxic. Intramuscular injection of BAL-in-oil at a dosage level of 3 mg. per kg. produced only the mildest reactions, whereas at levels of 5 mg. per kg., some or all of the following symptoms were observed: headache, nausea, burning sensation in mouth, nose and eyes, sweating, weakness, increased heart rate and sometimes rise in systolic and diastolic blood pressure. These symptoms were only transient. The American workers confirmed and extended observations made by British workers on BAL.

III. This is a general survey of BAL and its properties. BAL-intrav [see IV] is also mentioned, but no reports were available at the time of publication.

IV. The development of a compound (O-glucoside of BAL) called BAL-intrav and its properties are described. BAL-intrav penetrates very slowly into cells so that its effective distribution in the body is in the blood and intercellular fluids: this makes it a valuable therapeutic substance for systemic arsenic poisoning. LD_{50} of BAL-intrav to rats is 7·5 g. per kg. Rabbits were dosed with a LD_{95} of lewisite and treatment was delayed for six hours; the rabbits were then injected with 1·5 g. BAL-intrav per kg. and the mortality rate was reduced to 50%. When 4 mg. BAL per kg. were given with BAL-intrav, the mortality rate was reduced to 25%. BAL penetrates into the cells quickly and removes the arsenic there, whereas the BAL-intrav remains mainly in the extra cellular fluids and prevents arsenic from diffusing into the cells.

V. This is an annotation of the review by WATERS & STOCK [see II above].—N. SABA.

See also absts. **1689** (physics for the anaesthetist), **1690** (sulphonamide in theory and practice).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ROBERTSON, A. H. (1946.) **Laboratory procedures in sanitary milk control.**—*Amer. J. publ. Hlth.* **36.** 1245–1259. [Author's conclusions copied *verbatim.*] **1659**

Under either the U.S. Public Health Service Ordinance and Code (Plan A) or under the Connecticut State Department of Health Program (Plan B), the fundamental objectives of maintaining the highest possible assurance of safety and continuous conformance to the standards for low count milk have not been as fully achieved as might be expected.

Plan A would be improved by: (1) Requiring the routine testing of all samples of allegedly pasteurized milk using the phosphatase test and the coliform test. (2) Requiring a microscopic examination of all raw samples which fail to comply, especially when field inspectional methods fail to disclose the cause for high counts or short reduction times. (3) Requiring routinely a microscopic examination of all pasteurized samples to determine whether or not high count samples escape detection by the plate method. (4) Permitting the use, where determinations have been checked periodically and found satisfactory, of routine plant reports on inspections and analyses of samples by licensed purchasing agencies in lieu of official inspections and analyses.

Plan B would be improved by: (1) Securing proper legislation fixing, or allowing the Dairy and Food Commissioner to fix by official order, standards for bacterial density in terms of results by methods which are to be used officially for the determination of compliance with the statute. (2) Providing for more frequent routine inspections and examinations of samples, with prompt repeat inspections and repeat examinations of samples in cases of non-compliance until continuous conformance can be reasonably assured.

MCDOWALL, F. H. (1946.) **The collection of quarter milk samples by milking machine.**—*J. Dairy Res.* **14.** 231–233. **1660**

A description is given with diagrams of a modified milking machine bucket with accessories by which the milk from individual quarters can be collected simultaneously by means of a milking machine, but kept as separate samples for subsequent examination. The bucket contained four separate movable compartments, each with a capacity of $1\frac{3}{4}$ gal. The lid had four apertures, each discharging the milk from a single quarter into one of the compartments. The strip-cup had four compartments so that the strippings from any quarter could be added to the appropriate compartment of milk before weighing and examination.—J. KEPPIE.

BREESE, B. B., STANBURY, J. B., & UPHAM, H. C. (1944.) **Food poisoning at a naval training station.**—*Nav. med. Bull., Wash.* **42.** 1205–1215. **1661**

An account is given of seven outbreaks of acute food poisoning, in five of which the causative food was determined and in three of which bacteriological examination revealed haemolytic *Staph. aureus* as the causal agent.

Methods used for investigating food poisoning epidemics and suggested control measures are described.—R. ALLCROFT.

VAN MANEN, A. (1946.) Een geval van humane infective met Bact. enteritidis var dublin en invoeringkeuring. [*S. dublin* **infection of man**

during meat inspection.]—*Tijdschr. Diergeneesk.* **71.** 568–569. [English summary and French abst. from English summary.] **1662**

A laboratory assistant became infected during P.M. examination of a newborn calf in which there were kidney petechiae and fibrinous unilateral tarsitis. Symptoms were weariness, fever, headache and dizziness, but not diarrhoea; recovery was complete after four weeks.

S. dublin was isolated from the faeces of the patient and from cultivation of one lymph node on agar. Inoculations on agar and on glucose broth from both kidneys, three lymph nodes and pieces of meat were negative.

CAVANDOLI, H. E. (1944–45.) Inspección sanitaria de los productos de caza. **[Inspection of game animals and birds intended for human consumption in Buenos Aires.]**—*Rev. Med. vet., B. Aires.* **26.** 413–434 & 510–556 and **27.** 11–36. **1663**

C. gives an extensive review of the inspection of game animals and birds intended for human consumption. In the first part he deals with the zoological classification of those animals found in the Argentine, giving a complete description, and in the second he discusses their nutritive value and presents the results of experiments designed to ascertain the digestibility and the chemical composition of the flesh of various species.

Under sanitary inspection he includes identification and examination for both infective and parasitic diseases as well as preservation in cold storage. A note about legislation in the Argentine is added.—H. G. ARAMBURU.

MESQUITA, D. C. (1944.) Do grau de maturação das carnes de açougues consumidas na cidade do Rio de Janeiro. (Determinaçãs das taxas de amoníaco presentes nas carnes de açougues entregues as consumo diário da população). **[Degree of maturation of meat sold in Rio de Janeiro: ammonia estimation.]**—*Bol. Soc. brasil. Med. vet.* **13.** 17–32. **1664**

The city is supplied with fresh meat from two abattoirs and conditioned beef from three *frigorificos*. Samples from all five sources were analysed for NH_3 during the winter months of May and June, with the following results:– abattoir A, 16·43 mg. %; abattoir B, 15·3 mg. %; *frigorifico* Z, 14·5 mg. %; *frigorifico* Y, 17·7 mg. %; *frigorifico* X, 17·68 mg. %. The differences were accounted for as follows:– Abattoir B was technically superior to abattoir A. *Frigorifico* Z retained the meat for 72 hours before distribution and used insulated wagons. *Frigorifico* Y retained the meat for only 48 hours, but used ordinary wagons. *Frigorifico* X retained some of its meat for 96 hours and samples of this gave high NH_3% (30 and 35), but meat retained 48 hours gave only 10, 12 and 15%.—R. MACGREGOR.

—. (1943.) Proyecto de creacion de la direccion de ganaderia de la provincia. **[A proposed law for the control of the health of cattle in Buenos Aires.]**—1*er Congr. Méd. vet. Prov. B. Aires*, 1943. pp. 167–189. **1665**

At the first congress of veterinary surgeons held in the Province of Buenos Aires, Argentine, the Provincial Veterinary Medical Association presented a paper proposing the creation of a Livestock Bureau. This Bureau would comprise the following divisions: animal health and sanitary police, zootechnics, bacteriology, parasitology, protozoology, toxicology and livestock schools and experimental fields. Each was carefully analysed as to its functions and the cost was estimated. —H. G. ARAMBURU.

—. (1943.) Ante-proyecto de reglamentacion de la medicina veterinaria en el orden nacional. **[A proposed law for the nationalization of veterinary medicine.]**—1*er Congr. Méd. vet. Prov. B. Aires*, 1943. pp. 161–164. **1666**

At this first congress of veterinary surgeons in Buenos Aires, the Provincial Veterinary Medical Association proposed the establishment of a series of regulations governing the practice of veterinary medicine.—H. G. ARAMBURU.

HARDENBERGH, J. G. (1946.) **Veterinary medicine in Iowa.**—*Iowa Vet.* **17.** 12–15. **1667**

With the reduction of horses both on roads and farms, the veterinary profession in the U.S.A. was also reduced in numbers, particularly during 1918–42. Between 1918 and 1928, 15 institutions were closed, leaving ten only. The average yearly intake of the profession during this period was 632, but in 1928 only 120 degrees were granted. Thus in 1941 there were only 12,500 qualified men in the U.S.A., of whom 46% were over 50.

Public attention has now been called to the need for skilled veterinarians. The Universities of California and Illinois were to take veterinary students in 1947, and a veterinary school had been opened in 1945 at Tuskegee Institute for negroes. The A.V.M.A. is represented on the Inter-Association Council, consisting of the American Society of Animal Production, the Dairy Science Association, the Poultry Science Association, and the U.S. Livestock Sanitary Association. The A.V.M.A. has also started a Registry of Veterinary Pathology and collection of pathological specimens at the Army Medical Institute, which will also provide a diagnostic service. It is hoped that the profession will take an increasing part in public health services, abattoir supervision and cold storage and preservation of meat and poultry.—R. MACGREGOR.

—. (1946.) **Island quarantine station to aid livestock breeders.**—*Fed. Vet.* **3.** No. 5. 5. **1668**

Legislation has been passed authorizing the establishment by the Bureau of Animal Industry of a quarantine station on Swan Island, 150 miles from the coast of Honduras in the Caribbean Sea. The object is to facilitate import for breeding purposes of livestock such as zebu cattle and Caracul sheep. The facilities of the station are to be available to countries other than the U.S.A.

The new quarantine station will make it possible to import stock from countries where foot and mouth and other diseases exist.—M. C.

LINON, G. (1944.) Sur la nullité de la vente des animaux atteints de maladies légalement contagieuses. (Délaid impartis à l'acheteur pour l'opposer). [**The nullity of the sale of animals affected with contagious diseases.**]—*Rev. Méd. vét., Lyon et Toulouse.* **95.** 224–230. **1669**

The French laws of 1881 and 1898 forbid the exposure for sale of animals suspected of or diagnosed as having contagious disease; the law of February, 1905, completes this enactment by adding that if such a sale has taken place, it is legally null and void if it can be proved that the seller knew that the animal was infected.

In order to obtain redress, the authorities or the purchaser must take legal action within a period of 45 days after the purchase or within ten days of slaughter if the animal concerned has been slaughtered. There appears to be some doubt as to whether this also applies naturally if the animal dies. It is not clear, apparently, whether these provisions apply to a bovine animal affected with TB. in a form considered legally to be contagious. Should the authorities take legal action against a seller in any such case, it is made clear that their action is not to aid commerce or for the good of the purchaser, but is purely a matter of public health. L. continues with a consideration of methods of taking legal action, when it is instituted by the authorities and otherwise and when action is confined to the purchaser.—D. S. RABAGLIATI.

ZOOTECHNY

HORWOOD, R. E. (1946.) **Effective use of herd records.**—*Quart. Bull. Mich. agric. Exp. Sta.* **29.** No. 1. 7–14. **1670**

H. suggests that dairy records should be tabulated under eight different headings; the figures should then graphically point out any weaknesses in the system of management. The first six suggested tables refer to bionomic and production factors, of little direct veterinary interest. As an example, in table 3 the ages in months of heifers at the time of first calving are to be arranged for each year's working, together with the average age for each year. Scrutinized alongside production records, this table allows a truer value to be placed on the product of the first lactation, always greater when a heifer calves unduly late.

In table 7 cows removed from the herd are classified according to the cause of removal, *e.g.*, dairy purposes, low production, mastitis, shy breeders, etc. It is suggested that such a table will point out the best line of attack to minimize losses. Table 8 is a bid to collect statistics on the causes of heifer calf mortality between birth and date of first calving.

Examples are given from the college herd of about 15 cows.—F. L. M. DAWSON.

PULLES, H. A. (1940.) Het destructiewezen in Nederland. [**Slaughter methods in the Netherlands.**]—*Tijdschr. Diergeneesk.* **67.** 1025–1029 & 1030. **1671**

P. discusses the disposal of condemned meat and carcasses and the utilization of the by-products. He notes that the present legislation for controlling the spread of disease while the dead animal is being moved from the place where death occurred leaves much to be desired. Although there are strict regulations as to the type of vehicle to be used for the removal of material from the established centres of inspection, to the destructors there is no restriction on the type of vehicle used for the transportation of the carcasses from the farm or place of death to the inspection centre. He notes that the destructors are run by firms for profit and visits to destructors have convinced him that not enough care is practised at the factories to eliminate the possible contamination of the manufactured by-products with infective material arriving or awaiting processing at the factory. He observes that although the skin of pork is classified as meat, the pig carcasses are skinned, as there is a great demand for this product. Anthrax and other diseases can be readily spread by the by-products.

He considers that all destructors should be State owned and operations supervized by a veterinary surgeon.—P. L. LE ROUX.

REESER, H. E. (1941.) Graviditeitsreacties bij het paard. [**Pregnancy diagnosis in the mare.**]—*Tijdschr. Diergeneesk.* **68.** 624–639. [English, French and German summaries.] **1672**

R. reviews the pregnancy diagnosis methods of Aschheim-Zondek, Friedmann, Allen-Doisy, Cole and Hart, Cuboni, Nikolaeiv, Bercoritz,

Nito and Hogben, concluding that for farm animals Cuboni's test is accurate. An improvement in the technique is to read the result not in sunlight, but in ultra-violet light, comparing the test sample side by side with known positive and negative ones. The error is less than 2%.—J. E.

BERTHELON, M. (1944.) Quelques précisions sur le diagnostic biologique de la gestation chez la jument. **[The diagnosis of pregnancy in the mare.]**—*Rec. Méd. vét.* **120.** 7–10. **1673**

The Friedmann test which determines the gonadotropin content of serum has been found very reliable for the diagnosis of pregnancy between the 45th and 100th days. Rabbits must weigh 1·5 kg. or more and the condition of their ovaries must be known before the injection; 15–18 ml. of serum are injected intravenously and the ovaries are examined two days later. The Allen-Doisy test determines the oestrogen content of the urine and does not give reliable results until the 70th day of pregnancy. The animals used must be properly fed as lack of vitamin A may produce keratinization of the vagina.—J. M. R.

See also absts. **1576-1580** (artificial insemination), **1692** (artificial insemination in cattle).

TECHNIQUE AND APPARATUS

I. WILSON, A. T. (1945.) **Method for testing *in vitro* resistance of group A hemolytic streptococci to sulfonamides.**—*Proc. Soc. exp. Biol., N. Y.* **58.** 130–133. **1674**

II. REID, R. D., & ANDERSON, D. T. (1946.) **A method for determining bacterial resistance and susceptibility to sulfonamides and penicillin.**—*Science.* **103.** 454–455. **1675**

I. The growth of the organisms in a semi-synthetic medium containing serum in the presence of 1, 5, 25 and 125 mg. sulphadiazine per 100 ml. is observed. The test gives useful indications of the differences in susceptibility to the sulphonamide.

II. The organisms are grown in peptone agar medium containing known concentrations of sulphonamides or penicillin. The medium containing sulphonamides can be sterilized without any fall in concentration. The bacterial growth is noted after 24 and 48 hours' incubation following inoculation with a loopful of a culture.—E. B.

WIHMAN, G. (1942.) Nya anrikningsmetoder för tuberkelbaciller i sputum. **[New enrichment methods for sputum.]**—*Nord. Med.* **14.** 1524–1528. **1676**

M. describes a flotation enrichment method based on the facts that sputum contains fat (about 15%) and that tubercle bacilli contain lipoids. Sputum is added to four times its volume of physiological saline in a test tube and placed in an incubator at 65°–68°C. for 24 hours; this homogenizes the sputum without flocculation. 5 ml. of the sputum are removed from the top of the liquid and centrifuged and smear preparations are made from the sediment; Hallberg's night blue staining method is used.

This method is said to have revealed tubercle bacilli in 73 sputum samples as compared with 50 positive results with the same material examined by the direct smear method.—J. E.

REMLINGER, P. (1944.) Contribution a l'étude des colorations vitales en bactériologie. **[Vital staining in bacteriology.]**—*Arch. Inst. Pasteur Algér.* **22.** 1–7. **1677**

Young cultures of various organisms were stained with gentian violet, fuchsin, neutral red, phenol violet and methylene-blue. *B. subtilis* was sterilized after 53 days, but *V. cholerae* after only an hour; *B. anthracis*, staphylococci, *Streptothrix* after one day, and *Br. abortus*, *S. typhi* and *S. paratyphi*, coli bacilli and *Proteus* after 4–7 days. The motile organisms however retained their motility for considerable periods after sterility, *e.g.*, *B. subtilis* indefinitely and the others for 28 days. The cultures of anthrax, sterile *in vitro*, regained their powers of multiplication *in vivo* and were pathogenic to rabbits. This behaviour of the stained organisms corresponds with that of similar organisms submitted to radium emanation.

—R. MACGREGOR.

SPENCER, G. J. (1946.) **A cheap and speedy method of cleaning old microscope slides.**—*Science.* **103.** 456–457. **1678**

To clean old microscope slides mounted in Canada balsalm, S. separated them from one another in a spiral of copper wire, immersed them in boiling 10% aqueous sodium hydroxide for 2–3 min. and then washed them under a gentle stream of hot tap water. No further treatment was necessary.—LIONEL M. MARKSON.

MOREL, M. (1944.) Principe de dosage des coenzymes I et II par le test *Hemophilus parainfluenzae*. Application à l'urine. **[The titration of coenzymes I and II by the *H. parainfluenzae* test.]**—*Ann. Inst. Pasteur.* **70.** 37–49. **1679**

M. developed a technique for the estimation of coenzymes I and II (phospho-pyridino-nucleotides) by comparing the growth of *H. parainfluenzae* in a suitably buffered medium containing a known quantity of pure coenzyme I, with the rate of growth of the bacteria in a

medium containing the coenzymes. Growth of cultures was measured by the electrophotometer. Maximum development under the experimental conditions took place after 24–28 hours' incubation at 37°C. and lasted only four hours.

The concentration of coenzyme was found to be important. Below a certain level bacterial growth ceased. Above this level, growth increased with the amount of coenzyme, provided the concentration was not too high.

The test was applied to human urine, which normally contains coenzymes I and II. On an average, man excretes in 24 hours the equivalent in coenzymes of 1·2 mg. of cozymase. In the normal subject, the ingestion of nicotinamide, even in a high dosage, has no influence on the urinary excretion of coenzymes.—Isobel W. Jennings.

Van Someren, V. D. (1946.) **A simple technique for the fixation and staining of *Trichomonas* in cultures and vaginal mucus.**—*Vet. J.* **102.** 73–78. **1680**

A method is described for the fixation of *T. foetus* with Weigert's iodine solution. The subsequent staining was by Giemsa or by Heidenhain's iron-haematoxylin method, using Shortt's modification of the haematoxylin stain.

Consistently good results were obtained by this technique for staining the organisms in culture material or in bovine vaginal discharges.

Notes and a table are included on the morphology and measurements of a strain of *T. foetus* isolated in Kenya, together with photomicrographs.—A. E. Pierce.

MISCELLANEOUS

Carniglia, F. J. (1946.) **Can racing really be cleaned up?**—*Vet. Med.* **41.** 435–441. **1681**

Much progress had been made during the year to help improve the conditions in which racing is conducted in the U.S.A. This has included the formation of a "Thoroughbred Racing and Protection Bureau", with its aim the uncovering of any element detrimental to racing.

C. discusses the administration of drugs prior to a race and the various methods of their detection, stressing the difficulties encountered. The examination of saliva, blood serum and urine, which consists of obtaining a residue from a saliva sample and mixing it with sterile water and injecting it into a mouse for drug detection, the filming of races, tattooing for identification of horses and the close supervision of the stable area are all discussed. The utilization of the so-called "receiving barn", in which all horses should be kept for at least 1½ hours before the race is described.

The effects of hormone therapy and details of various hormones, and also the value of the analysis of the urine and of the blood plasma are discussed and C. criticises the value of results obtained by injecting mice with saliva residues.

—D. S. Rabagliati.

—. (1944.) Conmemoración del 61°. aniversario de la iniciación de las ciencias veterinarias en la República Argentina. **[Sixty-first anniversary of the establishment of veterinary science in the Argentine.]**—*Rev. Med. vet., B. Aires.* **26.** 305–312. **1682**

Teaching of veterinary science was introduced into the Argentine in 1883 with the foundation of the Faculty of Veterinary Sciences in Santa Catalina. The 61st anniversary of this faculty had just been celebrated.—H. G. Aramburu.

de Albuquerque, J. B. (1944.) Relatório de viagem a Perizes. **[Report on conditions in Perizes, Brasil.]**—*Bol. Soc. brasil. Med. vet.* **13.** 33–39. **1683**

The plain of Perizes is a low plain about 18 km. from the city of Rosario. It is covered by a low creeping vegetation with a few islands of timber marking the water holes. The cattle are mixed breeds of poor quality, though two efforts have been made to improve them by the introduction of good European and zebu bulls.

The area had suffered a severe drought, the vegetation was burnt and many of the water holes dry. There had been heavy mortality from thirst and hunger, aggravated by attacks by vultures on animals too weak to defend themselves. Disease was spreading rapidly as a result of crowding and contamination of the remaining water holes.

It was recommended that wells with wheel pumps and drinking troughs be provided throughout the area, and that water-holes be fenced off to prevent contamination.—R. Macgregor.

REPORTS

Great Britain. (1944.) **Annual report upon the health of Blackburn for the year 1943.** pp. 18. Items of veterinary interest pp. 5–6. fcp. Mimeographed. **1684**

One hundred and ninety-six samples of milk were submitted to the Public Analyst for examination and 12 were found not to be genuine. 4,492 head of cattle, 25,710 sheep, 2,504 calves, 841 pigs, and one goat were slaughtered at the Public Abattoir; 843 animals had lesions of Tubercu-

LOSIS and 122 carcasses were totally rejected for this cause whilst 163 carcasses were rejected for conditions other than TB.—J. S. S. INGLIS.

CANADA. (1940.) **Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31, 1940.** [GARDINER, J. G.] pp. 154. Items of veterinary interest pp. 38–40, 46, 49–52 & 98–102. Ottawa: E. Cloutier. 8vo. 50 cents. **1685**

Studies on strains of *Str. agalactiae* were continued. Experiments to determine the simplest method of MASTITIS diagnosis to obtain precise results made some progress.

ANTHRAX has never been very prevalent in Canada. One small outbreak occurred in the Province of Quebec. Interest in the eradication of TUBERCULOSIS continues to grow. There are now 8,567 fully accredited herds of purebred cattle and 51,277 herds under the Supervised Herd Plan. Under the Restricted Area Plan, applications for the establishment of new areas are still being received. No case of GLANDERS occurred. 2,134 herds are under supervision for BOVINE CONTAGIOUS ABORTION and of these 1,027 are officially listed free from the disease. Experimental studies with strain 19 of *Br. abortus* continued. A small group of vaccinated animals not exposed to infection went through their first pregnancies without any signs of infection. Experiments on the effect of vaccination on serum diagnostic tests appeared to show that if the vaccine were given early in life the animals in which agglutinins had been stimulated ceased to react within a few months, so that the vaccine did not permanently influence the serological reaction of the animal. BOVINE HAEMATURIA [REDWATER], a non-contagious disease peculiar to cattle, occurs in well defined localities of British Columbia, usually each year on the same premises. Investigation into the water, soil plant life and pasture vegetation has yielded no clue. EQUINE ENCEPHALOMYELITIS made only a rare appearance. About 50% of the equines in the three Prairie provinces were vaccinated early in the season; the disease did not appear among non-vaccinated horses, nor on farms where half the horses were vaccinated. No virus was recovered from birds, rodents or insects examined as possible carriers. The possibility of using an attenuated living virus to immunize foxes and mink against DISTEMPER had not yet reached a stage where field vaccinations could be carried out with any degree of safety.

Means were being developed for the removal of parasites from adult sheep before each pasturing season, to prevent reinfection of pastures subject to the sterilizing effect of the long Canadian winter. A new laboratory for poultry diseases was nearing completion.

The production of tuberculin, mallein and johnin at the Animal Research Institute met all demands. Other products included E.E. vaccine, *Br. abortus* vaccine, DISTEMPER antiserum and *Br. abortus* and *S. pullorum* antigens in large quantities. In the diagnostic laboratory 158,656 specimens were examined.

Studies on the resazurin test as a test of milk quality showed that when the pink colour was taken as endpoint the reduction time correlated closely with that of methylene-blue and averaged 25% shorter. The colour was affected by factors other than bacterial growth, milk from diseased udders causing changes soon after incubation (1–3 hours). There were 88 establishments operating under the Canned Foods Act. Animals slaughtered included 1,547,992 cattle, 786,219 sheep, 3,961,882 pigs, 2,918 buffalo, 1,331 elk, 109 moose, 242 deer, 12 yaks and 32 goats.

In the animal husbandry division the practical problems involved in the breeding, feeding and housing of animals were studied. Pasture fertilization and grazing studies with beef and cattle showed that (1) there is a limit to the amount of fertilizer that can be economically used, (2) that fertilization of pastures does not provide pasture over the dry period of summer and that (3) application of mineral fertilizers gave the most economical results on well established sod. The health of the Department's dairy herds was maintained at an exceptionally high standard. They were free from TUBERCULOSIS, CONTAGIOUS ABORTION, CALF SCOURS and breeding troubles and were almost entirely free from MASTITIS. Breeding with Clydesdale horses was satisfactory. Eight mares foaled, two foals dying, one from cyanosis and the other from JOINT ILL. The latter is attributed to the fact that the mare had been newly imported and had not received the regular potassium iodide treatment given to home-bred mares. The Clydesdale stallion imported in 1939 died of STRANGLES.

An investigation was in progress of the technique for permanently marking pedigreed livestock and dogs by tatooing, particularly in dark skinned animals.—J. A. GRIFFITHS.

I. CANADA: BRITISH COLUMBIA. (1945.) **Thirty-ninth report of the Department of Agriculture for the year 1944.** [MACDONALD, K. C.] pp. 176. Items of veterinary interest pp. 81–89 & 160. Victoria: C. F. Banfield. 8vo. **1686**

II. CANADA: BRITISH COLUMBIA. (1944.) **Thirty-eighth annual report of the Department of Agriculture for the year 1943.** [MACDONALD, K. C.] pp. 152. Items of veterinary interest pp. 72–74, 82–86, 92–92 & 143. Victoria: C. F. Banfield. 8vo. **1687**

I. Of 4,723 cattle subjected to the tuberculin

test, 11 reacted, six in one herd in which avian type TUBERCULOSIS was thought to account for the reactions. HAEMORRHAGIC SEPTICAEMIA, in both the intestinal and pectoral forms, caused severe losses in inland areas, but not in the coastal regions; change of pasture and vaccination was recommended as a prophylaxis. A policy of calf-hood vaccination against BOVINE CONTAGIOUS ABORTION was being developed. Blackleg ACTINOMYCOSIS, COCCIDIOSIS and EQUINE INFLUENZA, were recorded but were not of economic importance. No cases of EQUINE ENCEPHALOMYELITIS were encountered. In the Cariboo district, extensive losses in pigs appeared to be due to an AVITAMINOSIS. Farmers have been encouraged to treat sheep with anthelmintics.

II. Of 5,843 cattle which were tuberculin-tested, 35 reacted. It is claimed that JOHNE'S DISEASE, first encountered in 1942, is now virtually eradicated. Cases of EQUINE ENCEPHALOMYELITIS and NECROTIC STOMATITIS occurred.—G. B. S. H.

U.S.A. (Undated.) **Los Angeles County Livestock Department. Twenty-second annual report, fiscal year ending June 30, 1946.** [HURT, L. M.] pp. 45. Los Angeles, Calif.: County Livestock Department. 4to. Mimeographed. **1688**

There were no serious outbreaks of disease. MASTITIS was still a grave problem and was estimated as causing a 20% reduction of milk supply. Unskilful attempts at control by owners is a frequent cause of infection: one owner infected 25% of his cows by injecting them with penicillin, using one unsterilized syringe. The Department recommends strict cleanliness and washing the orifices of the teats with chlorine solutions. ANTHRAX is a serious problem on ranches and though good results have followed penicillin therapy its expense prevents its use on all but the most valuable animals. The incidence of TUBERCULOSIS remained at 0·138% in local cattle and 0·239% in imported cattle. One outbreak of swine BRUCELLOSIS occurred and as a result many piglets had necrosis and subsequent loss of their tails. EQUINE ENCEPHALOMYELITIS was being steadily reduced by systematic vaccination. Dietetic diseases, though easily remedied, caused considerable losses as owners tended to rush affected animals to the abattoirs without waiting for diagnosis.

Amongst poultry, PNEUMO ENCEPHALITIS seems to be the most serious disease. It appears to be identical with Newcastle Disease, except that it does not, as yet, cause a heavy mortality. This may be due to a slight difference in virulence and outbreaks with heavy mortality are therefore to be expected soon. Efforts to control other diseases are being hampered by uncontrolled use of vaccines by owners and other untrained personnel. The value of sulphaguinadine for COCCIDIOSIS is recognized but it is considered that equally satisfactory results can be obtained by the use of wire screen platforms under and round drinking troughs.

Amongst rabbits, PASTEURELLOSIS, particularly the genital form FAVUS, MUCOID ENTERITIS, SPIROCHAETOSIS and COCCIDIOSIS appear to be most prevalent. Advice is given on their control and treatment.—R. MACGREGOR.

BOOK REVIEWS

MACINTOSH, R. R. [M.A., M.D., F.R.C.S., D.A., Nuffield Professor of Anaesthetics, University of Oxford], & MUSHIN, W. W. [M.A., M.B., B.S., D.A., First Assistant, Nuffield Department of Anaesthetics, University of Oxford]. (1946.) **Physics for the anaesthetist.** pp. vii + 235. Oxford: Blackwell Scientific Publications Ltd. 8vo. 30s. **1689**

Technique is of such vital importance in anaesthesia that the publication of a book which explains the physical principles in a clear and concise way and in a manner so elementary as to be readily understood by those who have long since forgotten what they learned in their earlier studies will find many grateful readers. This book is written by two practising anaesthetists with considerable teaching experience, assisted by MISS MCLARTY whose ability to illustrate the text with explanatory drawings has converted the book into a story in pictures. There are nearly 300 illustrations and much of the text consists of legends describing them: one cannot imagine a more interesting and instructive textbook of physics. Some of the procedures used in anaesthesia in man have not found their way into veterinary medicine, for a variety of reasons, but the book contains so much which relates to general principles that veterinarians cannot fail to find it of value.—E. G. WHITE.

LAWRENCE, J. S. [M.D. (Ed.), M.R.C.P., Physician, Haymeads Emergency Hospital, Bishop's Stortford]. (1946.) **The sulphonamides in theory and practice.** pp. vii + 125. London: H. K. Lewis & Co., Ltd. 8vo. 9s. **1690**

Advances in the field of sulphonamides have slowed down recently and this is therefore a good time for reviewing the knowledge acquired. The present book has been written especially for the average practitioner and many facts have been

included in its 115 pages. The author first discusses the mode of action of sulphonamides and the pharmacology of the most important members of the group. A very short chapter is devoted to the general principles governing the use of these drugs and their application in various conditions is discussed. In the chapter on toxicity, allergic and general toxic effects are clearly differentiated. The author warns against under- and over-dosage and other abuses and the book concludes with a description of tests used in estimating the sulphonamide content of the blood and urine. The book is, of course, very condensed, but there is a reasonable bibliography, in which the important review by HENRY [see *V. B.* **15.** 27] on the mode of action of sulphonamides is, however, not mentioned.—J. M. ROBSON.

CARTER, C. F. [B.S., M.D.]. (1944.) **Microbiology and pathology.** pp. 777. 200 figs., 25 plates. St. Louis: C. V. Mosby Company. 3rd Edit. 8vo. **1691**

This book is written for students of nursing and deals with those aspects of bacteriology and pathology which they need to understand.

It gives a good general outline of these subjects and of their practical application in the handling of human diseases.—E. COTCHIN.

HAMMOND, J. [M.A., D.Sc., F.R.S. (Editor)], EDWARDS, J. [M.Sc.], ROWSON, L. E. A. [M.R.C.V.S.], & WALTON, A. [B.Sc., Ph.D.] (1947.) **The artificial insemination of cattle.** pp. vii + 61. 25 figs. Cambridge: W. Heffer & Sons Ltd. 8vo. 3s. 6d. **1692**

This little book is intended to help those who are commencing artificial insemination in their own herds, as well as those founding new communal centres. It comprises sections of nearly equal length on technical methods and the organization of societies. Both are concisely expressed and present a great deal of valuable information. In the section on organization, stress is rightly laid on the cardinal importance of safeguarding the bull's willingness to serve and the section on applied bovine psychology in this respect is the most interesting and illuminating part of the book. Repetition on this topic in both sections is presumably deliberate.

There is a useful appendix on pregnancy diagnosis. It is stated that pyometra and mummified foetus may both be diagnosed by absence of developing cotyledons and by accompanying cervicitis. A mummified foetus may, however, be accompanied by cotyledons that feel almost normal though they are not developing, and cervicitis with a discharge is probably as frequent in pregnancies that go to an apparently normal term, or terminate in abortion, as it is in pyometra cases where the vagina and cervix are often perfectly clean.—F. L. M. DAWSON.

BRESSOU, C. [Directeur de l'École Nationale Vétérinaire d'Alfort]. (1941.) L'enseignement vétérinaire en Europe. **[Veterinary education in Europe.]** pp. vii + 176. 11 appendixes. Paris: Vigot Frères. 8vo. **1693**

The object of this book, the publication of which was delayed from the autumn of 1939 owing to the outbreak of war, is to give an account of the state of veterinary education in Europe as revealed by answers to a questionnaire sent out during the academic year 1937–38 to the various veterinary schools, supplemented in some cases by visits.

The countries and schools dealt with are:—Germany, including Austria (Berlin, Giessen, Leipzig, Munich, Hanover, Vienna), Belgium (Brussels, Ghent), Bulgaria (Sofia), Denmark (Copenhagen), Eire (Dublin), Spain (Madrid, Leon, Saragossa, Cordova), Estonia (Tartu), France (Alfort, Lyons, Toulouse), Great Britain (London, Edinburgh, Liverpool, Glasgow), Hungary (Budapest), Italy (Bologna, Messina, Milan, Naples, Parma, Pérouse, Pisa, Sassari, Turin, Camerino), Latvia (Riga), Norway (Oslo), Holland (Utrecht), Poland (Warsaw, Lwow), Portugal (Lisbon), Roumania (Bucharest), Sweden (Stockholm), Switzerland (Berne, Zurich), Czechoslovakia (Brno), Turkey (Ankara), and Jugoslavia (Belgrade, Zagreb).

For each country, an account is given of the general organization of veterinary education together with the details for each school, covering the qualifications and admission of students, the syllabus of theoretical and practical instruction, the examination system, the staffing of the various departments, the organization of research in the schools, and financial matters. Appendixes summarize in tabular form information on the area, human population, animal population, number and proportion of veterinarians, number of veterinary students, status of the various schools, duration of studies and fees for instruction and examination.

The book contains an immense amount of information and it will be of great interest to all concerned in the organization and improvement of veterinary education.—E. COTCHIN.

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